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The following works have been received for review:—

Kemmerich's Fleischpepton und die über daselbe erschienenen Veröfentlichungen zusammengestelt, von Dr. Med. Carl Brendel. Berlin, 1885.

Ist es möglich für die verschiedenen Erkrankungen des Ruckenmarks bestimmte balneotherapeutische Indikationen und Methoden aufzustellen? von Dr. Groedel in Bad-Nauheim. Sonder-abdr. aus Deutsche Medizinal-zeitung, 1885. No. 29. Berlin, 1885.

Endarteritis Syphilitica cerebri, bei seinem 20 monatlichen hereditäre-luetischen Kinde, von Dr. A. Seibert, Kinderarzt am deutschen Dispensary in New York. Reprint, 1885.

Illicium Floridanium, Ellis. Histological and Chemical Examination. Thesis presented to Philadelphia College of Pharmacy, by Henry Charles Christian Maisch.

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Rules for the General Management of Infants, recommended by the Obstetrical Society of London. London: Longmans, Green & Co., 1885.

Harveian Lectures on the Mode of Death from Acute Intestinal Strangulation and Chronic Intestinal Obstruction, delivered before the Harveian Society of London, 1885. By Thomas Bryant, F.R.C.S., Senior Surgeon to and Lecturer on Surgery at Guy's Hospital. London: J. & A. Churchill, 1885.

Operative Surgery in the Calcutta Medical College Hospital. Statistics, Cases, and Comments. By Kenneth McLeod, A.M., M.D., F.R.C.S.E., Fellow of the University of Calcutta. London: J. & A. Churchill, 1885.

Endemic Goitre, or Thyreocele. By William Robison, M.D. and M.S. London: J. & A. Churchill, 1885.

Clinical Lectures on Scrofulous Neck. By T. Clifford Allbutt, M.A., M.D. Cantab., F.R.S., F.R.C.P., Consulting Physician to the Leeds General Infirmary; and on the Surgery of Scrofulous Glands. By T. Pridgin Teale, M.A., M.B. Oxon., F.R.C.S., Consulting Physician to the Leeds General Infirmary. London: J. & A. Churchill, 1885.

The Regimen to be adopted in Cases of Gout. By Wilhelm Ebstein, Professor of Clinical Medicine in Göttingen. Translated by John Scott, M.A., M.B., Honorary Physician Manchester Southern Hospital for Diseases of Women and Children. London: J. & A. Churchill, 1885.

On some Common Injuries to Limbs, their Treatment and After-treatment, including Bone-setting (so called). By Edward Cotterell, M.R.C.S. Eng., L.R.C.P. Lond., Late House-Surgeon University College Hospital. Illustrated. London: H. K. Lewis, 1885.

What to do in Cases of Poisoning. By William Murrell, M.D., F.R.C.P., Lecturer on Materia Medica and Therapeutics at the Westminster Hospital. London: H. K. Lewis, 1884.

Aneurisms of the Aorta, with especial reference to their Position, Direction, and Effects. By Oswald Browne, M.A., M.B. London: H. K. Lewis, 1885.

The Child's Voice: Its Treatment with Regard to After-development. By Emil Behnke, Lecturer on Vocal Physiology, and Teacher of Voice Production. London: Sampson Low, Marston Searle & Rivington, 1885.

Voice Use and Stimulants. By Lennox Browne, Senior Surgeon to the Central London Throat and Ear Hospital. London: Sampson Low, Marston Searle & Rivington, 1885.

A Practical Treatise on Urinary and Renal Diseases, including Urinary Deposits. Illustrated by numerous Cases, and engravings. By William Roberts, M.D., F.R.S.

Lond. Assisted by ROBERT MAGUIRE, M.D. Lond., M.R.C.P. Lond. Fourth edition. Philadelphia: Lea Brothers & Co., 1885.

A Treatise on the Science and Practice of Midwifery. By W. H. PLAYFAIR, M.D., F.R.C.P., Professor of Obstetric Medicine in King's College. Fourth American from the Fifth English edition, with notes and additions. By ROBERT P. HARRIS, M.D. With three plates, and two hundred and one illustrations. Philadelphia: Lea Brothers & Co., 1885.

A System of Practical Medicine by American authors. Edited by WILLIAM PEPPER, M.D., LL.D., Provost and Professor of the Theory and Practice of Medicine and of Clinical Medicine in the University of Pennsylvania. Assisted by LOUIS STARR, M.D., Clinical Professor of Diseases of Children in the Hospital of the University of Pennsylvania. Vol. II. General Diseases continued, and Diseases of the Digestive System. Philadelphia: Lea Brothers & Co., 1885.

A Treatise on Practical Chemistry and Qualitative Inorganic Analysis, adapted for use in the Laboratories of Colleges and Schools. By FRANK CLOWES, D.Sc. Lond., Fellow of the Chemical Societies of London and Berlin. With illustrations. From the fourth English edition. Philadelphia: Lea Brothers & Co., 1885.

A Text-Book of Medical Physics for the Use of Students and Practitioners of Medicine. By JOHN C. DRAPER, M.D., LL.D., Professor of Chemistry and Physics in the Medical Department of the University of New York. With three hundred and seventy-seven illustrations. Philadelphia: Lea Brothers & Co., 1885.

Transactions of the American Surgical Association. Vol. II. Edited by J. EWING MEARS, Recorder of the Association. Philadelphia: P. Blakiston, Son & Co., 1885.

A Guide to the Diseases of Children. By JAMES FREDERICK GOODHART, M.D., F.R.C.P., Assistant Physician to Guy's Hospital, and Lecturer on Pathology in its Medical School. Revised and edited by LOUIS STARR, Clinical Professor of Diseases of Children in the Hospital of the University of Pennsylvania. With Formulæ. Philadelphia: P. Blakiston, Son & Co., 1885.

A Treatise on Amputations of the Extremities, and their Complications. By B. A. WATSON, A.M., M.D., Surgeon to the Jersey City Charity Hospital. Illustrated by upwards of two hundred and fifty engravings, and two full-page plates. Philadelphia: P. Blakiston, Son & Co., 1885.

Clinical Studies of Diseases of the Eye, including those of the Conjunctiva, Cornea, Sclerotic, Iris, and Ciliary Body. By Dr. FERDINAND RITTER von ARLT, Professor of Ophthalmology in Vienna. Translated by LYMAN WARE, M.D., Surgeon to the Illinois Charitable Eye and Ear Infirmary. Philadelphia: P. Blakiston, Son & Co., 1885.

Urinary and Renal Derangements and Calculous Disorders. Hints on diagnosis and Treatment. By LIONEL S. BEALE, M.D., Fellow of the Royal Society and of the Royal College of Physicians. Philadelphia: P. Blakiston, Son & Co., 1885.

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Face and Foot Deformities. By FREDERICK CHURCHILL, C.M., Surgeon to the Victoria Hospital for Children. With illustrations of new appliances for the Cure of Birth-Mark, Club-foot, etc. Philadelphia: P. Blakiston, Son & Co., 1885.

Micro-Chemistry of Poisons, including their Physiological, Pathological, and Legal Relations, with an Appendix on the Detection and Microscopic Discrimination of Blood. Adapted to the use of the Medical Jurist, Physician, and general Chemist. By THEODORE G. WORMLEY, M.D., Ph.D., LL.D., Professor of Chemistry and Toxicology in the Medical Department of the University of Pennsylvania. With ninety-six illustrations on steel. Second edition. Philadelphia: J. B. Lippincott Company, 1885.

The Nature of the Mind and Human Automatism. By MORTON PRINCE, Physician for Nervous Diseases Boston Dispensary. Philadelphia: J. B. Lippincott Company, 1885.

The Laws of Health; or How Diseases are Produced and Prevented; and Family Guide to Protection against Epidemic Diseases and other dangerous infections. By J. R. BLACK, M.D. Philadelphia: J. B. Lippincott Company, 1885.

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On the Wasting Diseases of Infants and Children. By EUSTACE SMITH, M.D. London. Fourth edition. New York: Wm. Wood & Co., 1885.

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A Treatise on Asiatic Cholera. Edited and prepared by EDMUND CHARLES WENDT, A.M., M.D., Curator and Pathologist of St. Francis Hospital, in association with Drs. JOHN C. PELLET, of New York, ELY MCCLELLAN, U. S. A., JOHN B. HAMILTON, Surgeon-General U. S. Marine Hospital Service, and GEORGE M. STERNBERG, U. S. A. Illustrated with maps and engravings. New York: William Wood & Co., 1885.

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The Wills Eye Hospital Report for the year ended December 31, 1884.

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Supplement to the Transactions of the Sei I Kwai, or Society for the Advancement of Medical Science in Japan. Transactions, No. 39. Supplement, No. 4. Tokio, April, 1885.

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2. Intestinal Obstruction. Its Varieties, with their Pathology, Diagnosis, and Treatment. The Jacksonian Prize Essay of the Royal College of Surgeons of England, 1883. By Frederick Treves, F.R.C.S., Surgeon to and Lecturer on Anatomy at the London Hospital; Hunterian Professor of Anatomy at the Royal College of Surgeons of England. With 60 Illustrations. Philadelphia: Henry C. Lea's Son & Co., 1884. 187

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2. Seventh Annual Report of the State Board of Health of the State of Connecticut for the fiscal year ending Nov. 30, 1884. New Haven, pp. 385. 1885.
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ARTICLE I.

THE SURGICAL TREATMENT OF CYSTS OF THE PANCREAS.[1]

By N. SENN, M.D., of Milwaukee, Wis.

OF all abdominal organs the pancreas has been least frequently subjected to surgical treatment. The anatomical location of this organ, and the obscurity of its affections, furnish a sufficiently satisfactory explanation for this treatment. Situated high up in the abdominal cavity, and hidden behind such important organs as the stomach, omentum, and transverse colon, it is the least accessible of all abdominal organs, and on this account its affections, wrapped in obscurity, have for the most part constituted objects for empirical medication. The relation of this gland to the surrounding organs and its great distance from the anterior wall of the abdomen, the only point of approach, necessarily offer serious obstacles to diagnosis and direct treatment. In a diagnostic point of view I may also refer to another great difficulty—our want of positive knowledge concerning the physiological functions performed by this gland in the process of digestion. As the symptomatology of all affections of the pancreas is always obscure, and a probable diagnosis can only be made in cases where the gland has become considerably enlarged by disease, it is apparent that our present clinical knowledge is limited to diseases which increase the size of the organ to a sufficient extent to permit its detection by palpation. Primary malignant disease of the pancreas when it has advanced to such an extent that its presence can be diagnosticated with certainty by physical signs, will have invaded the adjacent tissues to such a degree as to preclude the advisability of an operation, consequently the efforts by the surgeon, for the present at least, must be directed exclusively towards the recognition and treatment of benign affections of this gland. Clinical experience does not extend beyond an imperfect knowledge of cysts of the pancreas.

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[1] Read before the Surgical Section of the American Medical Association, at New Orleans, April 29, 1885.

The pancreas, like other secretory organs, is prone to become the seat of cystic tumors, the result of obliteration or obstruction of the common duct, or one or more of its branches. Cysts originating in this manner are true retention cysts, containing the physiological secretion from the distal portion of the gland tissue, with perhaps accidental products, such as altered secretions, blood, and the products of inflammation.

In the preparation of this paper it has been my intention to present a full report of a case of retention cyst of the pancreas, which has recently come under my observation, and, at the same time, summarize, in a compact form, the clinical history of similar cases which will serve as a basis for some general remarks "on the surgical treatment of cysts of the pancreas."

Case I. *Cyst of Pancreas; Laparotomy; Recovery.*—Volz, æt. 19, laborer, German, was admitted to Milwaukee Hospital Nov. 28, 1884. He is small for his age and not robust, but he claims that, with one exception, he has never been sick, and that no hereditary tendency to disease exists in his family. Five weeks ago, while enjoying perfect health, he was thrown from a wagon, striking the ground on the left side of the abdomen, a heavy keg falling upon his back, and increasing the force of the fall. The pain felt immediately after the accident was confined to his back, at a point where he was struck by the keg, but it was not sufficient in intensity to prevent him from following his occupation as a mason's apprentice. In a few days, however, diarrhœa set in, which persisted for two weeks, greatly reducing his strength and weight. If he had any fever during this time it was not sufficiently severe to attract his attention. His appetite was not impaired, and, though he vomited occasionally, neither vomiting nor the diarrhœa seemed to be aggravated by the time of eating or the kind or variety of food. After two weeks he noticed a tumor in the left hypochondriac region, which was round, smooth, and painless. The tumor increased rapidly in size, and soon gave rise to a sensation of fulness in the stomach, and later on, to regurgitation and vomiting soon after meals. Appetite slightly impaired. At this time the patient was treated for a short time by my friend, Dr. F. H. Day, of Wauwatosa, Wis., who resorted to symptomatic treatment, and observing no improvement, referred him to me for diagnosis, and, in case it should be deemed advisable, for surgical treatment.

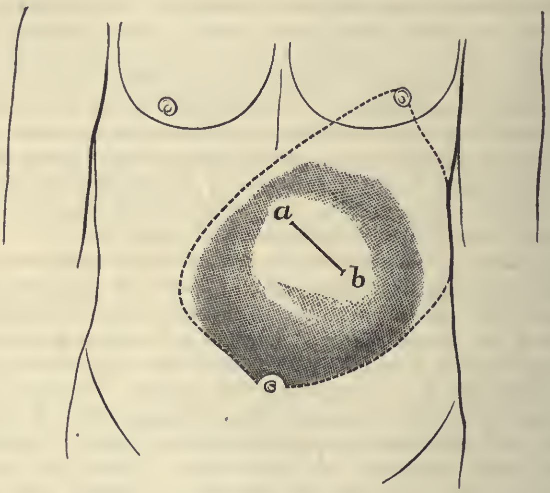
On his admission to the hospital he presented a considerable degree of emaciation, and complained principally of a sensation of fulness and weight in the region of the stomach, which was always aggravated after meals, and only relieved by vomiting. On inspection a tumor was found which occupied nearly the whole epigastric, and the entire left hypochondriac region, its most prominent point being to the left of the median line, and about three inches below the xyphoid cartilage. Percussion revealed a line of dulness extending from the left nipple to within an inch above the umbilicus; posteriorly the dulness reached from the eighth to the lower margin of the twelfth rib; in the epigastric region a limited area of tympanitic resonance was discovered along the costal arch of the lower ribs on the right side. Palpation showed distinct fluctuation, the wave being conveyed from side to side across the whole area of dulness. The tumor was round in contour, and presented a smooth surface. The measurements were as follows: From the left nipple to the lowest point downwards, $8\frac{4}{5}$ inches; the transverse diameter, $8\frac{2}{5}$ inches, and the circumference of body over tumor, $25\frac{1}{5}$ inches. The heart was displaced upwards so that the impulse of the apex could be distinctly felt in the fourth intercostal space. The stomach was artificially distended with carbonic acid gas, when it was ascertained that it was pushed to the right and compressed by the tumor. The liver appeared to be unaffected by the tumor, as, on percussion, it was found in its normal location and of natural size. Both lumbar regions were tympanitic. No evidences of ascites. Firm pressure over any part of the tumor could be made without causing pain. The peculiar fremitus often felt in cases of echinococcus cysts was absent. No pulsations could be felt in the tumor, and no impulse was imparted to it by the underlying abdominal aorta. The relative position of the tumor was changed during forcible inspiration and expiration.

For the purpose of ascertaining the nature of the contents of the tumor a hypodermic needle was thoroughly disinfected and introduced at a point where the tumor was most prominent, and, when in place, the distal end of the syringe moved upward and downward synchronously with the respiratory movements, showing that the adhesions with the parietal peritoneum, if any existed, were slight. The fluid which was removed was somewhat viscid and slightly opalescent. It was alkaline in reaction and contained a considerable proportion of albumen, as it coagulated on applying heat and nitric acid. Under the microscope it showed only a few morphological elements, epithelial cells, leucocytes, granular matter, and no hooklets or cholesterine crystals.

By exclusion the diagnosis was narrowed down to one of two things: a sterile echinococcus cyst, or cyst of the pancreas. Against the former spoke the growth of the tumor, its primary origin away from the liver, its favorite location, the presence of considerable amount of albumen, and the absence of hooklets, the presence of which are diagnostic of echinococcus cysts. In favor of a pancreatic cyst spoke the following: The history of traumatism in the region of the pancreas, the rapid growth of the tumor, and the early disturbance of digestion as manifested by diarrhœa and vomiting, presumably caused by the partial or complete retention of the pancreatic secretion. As the treatment remained the same in either case, it was decided to perform laparotomy and stitch the cyst walls to the peritoneal covering of the wound, in the absence of adhesion, and to open and drain the cyst after adhesions had formed. This procedure was deemed preferable to the use of the trocar, or aspirator, as it would with certainty prevent extravasation of the cyst contents into the peritoneal cavity, and the drainage-tube would guard against reaccumulation of the fluid, thus affording an opportunity of the cavity undergoing obliteration by adhesion of the inner surfaces of the cyst walls.

The patient being cognizant of the fact that no other form of treatment would promise any relief, readily assented to the operation proposed.

Every precaution was observed to render the operation aseptic. The patient was given several baths. The parts were shaved and carefully disinfected with a five per cent. solution of carbolic acid; the instruments, sponges, and operating room being prepared as for an ovariotomy. Before ether was administered, the stomach was emptied, and washed out by means of an elastic stomach-tube, with a view to prevent retching and vomiting during and after the operation. An incision five inches in length was made obliquely over the most prominent portion of the tumor, about three inches below, and parallel with, the left costal arch. A portion of the rectus-abdominis muscle was divided. After dividing carefully all the tissues down to the peritoneum, all hemorrhage was carefully and completely arrested. On opening the peritoneal cavity the omentum was brought into view; the portion exposed contained an artery and a vein of considerable size. As these vessels were placed in a vertical direction, they crossed the wound, and it became necessary to apply a double ligature, the omentum being then incised between them to the extent of about three inches. The omentum was slightly adherent to the parietal peritoneum and the surface of the tumor.



Space within the dotted lines indicates area of dulness. *a—b* is the line of incision.

Through the omental incision the tumor could be distinctly seen and felt, presenting a smooth, whitish, and glistening surface. As it had formed at least slight adhesions, it was decided to complete the operation. This plan was the more willingly adopted, as it was evident that the intracystic pressure was great, and the cyst wall thin, which would render stitching them to the margins of the wound difficult and unsafe. The surface of the tumor was then seized with two dissecting forceps, about an inch apart, and gentle traction made during incision and evacuation of the cyst, so as to prevent all risk of extravasation of fluid into the peritoneal cavity. The peritoneal covering was picked up and nipped, and a grooved director was inserted into the opening made; owing to the thinness of the walls of the sac it penetrated the interior, and fluid escaped along the groove with considerable force. The opening was enlarged with the knife, when the fluid gushed forward in jets and was caught in basins. The contents were removed as completely as possible by making external pressure and by placing the patient on the side. As the cyst was emptied its walls were drawn forward into the wound and stitched to the parietal peritoneum, which had been previously united with the skin. The interior of the cyst was explored by inserting the index finger, which passed directly backward toward the tail of the pancreas. The bottom of the cavity could, however, not be reached. The inner surface of the cyst was smooth. Two large drainage-tubes were inserted to the bottom of the cyst, and the remaining portion of the wound united in a similar manner as after ovariotomy, only that the rectus muscle was sutured separately. The fluid removed was estimated at three quarts, and presented the same appearance as that which was removed by the exploratory puncture.

The wound was dressed with a large antiseptic compress which was retained *in situ* by an elastic rubber bandage. This bandage, made of rubber webbing, not only retains the dressing perfectly, allowing, at the same time, the movements of the chest and abdomen, but has an additional advantage, inasmuch as it exerts equal pressure—an important element in the after-treatment of all abdominal operations.

The patient never vomited during or after the operation, and experienced immediate relief on removing the pressure which was caused by the tumor. The pulse never rose over 90, and the highest temperature observed was 100° F., the day after the operation. The appetite increased, and no unpleasant subjective symptoms were complained of at any time. On the third day the dressing showed moisture on the external surface, and it was changed. The gauze was saturated with the secretions from the cyst. The wound looked healthy, but the surrounding skin, as far as the dressing had extended, was red and macerated, and the epidermis could be removed in large flakes, leaving beneath a raw surface. The changes in the skin presented the same appearances as described by Kulenkampff and Gussenbauer, and claimed by them to be due to the digestive power of the pancreatic juice. The excoriated surface was sprinkled with salicylic acid, and was again covered with a Lister dressing. On account of profuse secretion from the cyst the dressings were changed every few days, and at every change the skin was found excoriated as far as it had been moistened by the secretion.

At the end of the first week the sutures were removed, and no further dressings were applied; whereupon the skin healed without suppuration, and only a minimum amount of pus escaped through the fistulous opening with the secretion. The secretion became clearer after the operation and continued to discharge in varying quantities for almost four weeks. One of the drainage-tubes, inserted at the time of the operation, was removed at the first change of the dressing, and the second was gradually shortened and entirely removed three weeks after the operation. At the end of the second week the cyst was explored with a disinfected probe, which passed to the depth of eight inches in the direction of the tail of the pancreas. The fistulous tract soon became lined with granulations and grew smaller in length and diameter, so that, at the end of eight weeks, it was very narrow, admitting only a small probe, which could be passed to a depth of four inches. The skin around the fistulous opening had been drawn inward, forming a deep, funnel-shaped depression.

Jan. 22, 1885. Patient discharged, cured. Fistula completely closed. Retraction of cicatrix very marked. General health good; digestion perfect. No swelling can be felt in the region of the pancreas.

Remarks.—The clinical history is somewhat similar to analogous cases which will be referred to in this paper. It was my intention to collect some of the secretion for the purpose of ascertaining its digestive properties on different articles of food, but before this could be done the amount secreted daily became so small that it was impossible to obtain corroborative diagnostic evidence from this source. The anatomical location of the tumor, its relations to the surrounding organs, its rapid growth, and the character of its contents can leave no possible doubt that we had to deal with a genuine retention cyst of the pancreas.

The question naturally arises: "What was the cause of the obstruction?" The history of the case points clearly to traumatism as the exciting cause. The patient had been in good health until he received the injury, and since that time he had not been well, although he continued at his work for some time afterward. Whether the diarrhœa, from which he suffered for the first two weeks, resulted from injury of the pancreas we are unable to prove, but it may be possible that a retention of the pancreatic secretion occurred after the traumatism; that diarrhœa may have been produced by the absence of this fluid in the intestinal tract. As the patient at this time was not under medical observation the character of the stools was not ascertained. As the injury was inflicted in the region of the pancreas it is reasonable to assume that the pancreatic duct and the parenchyma of the gland were lacerated at a certain point, producing obstruction to the outflow of the secretion from the distal portion of the organ. The nature of the injury and the manner of obstruction were the same as in cases of rupture of the male urethra. It would be difficult to imagine that the common duct could be distended by the accumulation of the retained fluid to such an enormous extent in such a remarkably short time, hence we are forced to conclude that laceration of the duct took place, and that the pancreatic fluid infiltrated the gland, and the cyst formed at the expense of its parenchyma and by distension of the capsule of the organ. The cyst wall, anteriorly, was so thin that after cutting the peritoneal covering the grooved director penetrated directly into the interior of the cyst without using more than the slightest force, which would show that nothing but a little connective tissue was interposed between the peritoneum and the cyst contents. The rapid growth of the cyst would indicate that the obstruction occurred at some distance from the caudal extremity of the gland, thus making a considerable portion of the secretive tissue contributory to the formation of the cyst. The early cessation of the discharge of the secretion through the abnormal outlet would tend to prove either that after the removal of the intra-cystic pressure, the duct again became permeable, and thus furnished a free passage to the secretions into the intestinal canal through the natural channel; or, that the gland tissue in the vicinity and distal to the cyst had been destroyed.

In regard to the operation, it is necessary to say that I deviated from the usual plan, in not making the incision through the *linea alba*. The incision was made over the most prominent part of the tumor, for the following substantial reasons:—

1. If adhesions had formed they would naturally begin at a point where the tumor impinged most firmly against the anterior abdominal wall.
2. Incision over the most prominent portion of the cyst would afford the best point for effective drainage.
3. The band of connective tissue, which would result from atrophy and obliteration of the cyst, would form a permanent bridge between the cicatrix of the abdominal wound and the gland. Consequently it was deemed advisable to establish this necessary evil where it would do the least harm by interfering with the functions of important organs.

Aspiration of the cyst was not practised, because the exploratory puncture had demonstrated that firm adhesions had not taken place, and, in the absence of these, it was feared that some of the cyst contents might escape into the peritoneal cavity and produce peritonitis. The maceration of the skin was the result of the digestive action of the pancreatic juice, and this phenomenon furnished strongly corroborative diagnostic evidence in this as well as in previous cases. The literature on the subject of cysts of the pancreas is extremely meagre, and, after diligent search, I have only been able to find an account of the following cases, of which I will give a brief report:—

CASE II. Kulenkampff's Case. (Ein Fall von Pancreasfistel, *Berliner Klinische Wochenschrift*, Feb. 13, 1882.)—E., male, æt. 39, laborer, otherwise healthy, received a number of heavy blows on the abdomen on March 22, 1881. The blows were received, as the patient believes, about the umbilicus, and in the direction from below upward. When examined a few hours later, no external signs of contusion could be seen, although he complained of intense pain in the upper abdominal and right hypochondriac regions. Great tenderness on pressure. On the right side posteriorly, above the diaphragm, dulness over an area three inches in height. As the patient complained of lancinating pains in the same locality, and respiration was difficult, the attending physician was induced to diagnosticate traumatic pleurisy. In a few days febrile symptoms and pain subsided, and in three weeks the patient seemed to be convalescent. Occasional attacks of pain in the hepatic and epigastric regions remained, and also tenderness on pressure. Physical examination at this time yielded only a negative result.

Toward the latter part of May a swelling made its appearance, which seemed to take its origin from the liver. This swelling increased in size until September, when the following conditions were noted: In the epigastric region a round, dense, non-fluctuating tumor can be felt of the size of a double fist. The larger part of the swelling is located on the right side of the mesial line. Its lower margin extends to within one and one-half inches of the umbilicus. Percussion dulness continuous, with the liver giving the impression as if the tumor sprang from the left lobe of this organ. Tumor ascends and descends during the respiratory movements. Pulsation in an anterior direction. No bruit. Palpation unsatisfactory on account of the contraction of the recti muscles. Appetite and digestion not impaired. Temperature normal, no icterus. Examination of urine and stools furnished no clue to the diagnosis.

As, from the existing signs and symptoms, no diagnosis could be made, it was decided to render the tumor more accessible by dividing the tissues down to the peritoneum. On September 14th an incision was made through the linea alba down to the peritoneum. To the touch the tumor, which moved freely with respiration, imparted the sensation of a tense, nodular liver, as in cirrhosis of this organ. The trocar of an aspirator was now introduced toward the right of the mesial line, and, after penetrating through dense tissue the distance of two-fifths of an inch, a cavity was reached, from which about a quart of clear fluid was evacuated. The peritoneal cavity was not opened, and the wound was packed with gauze, over which an antiseptic dressing was applied. The diagnosis of an echinococcus cyst, which had already been entertained, was strengthened by this examination. The fluid removed coagulated spontaneously on standing for some time; also on applying the test for albumen. It contained no succinic acid. In the deposit, which was very scanty, blood and lymph corpuscles were discovered. On September 20th the peritoneum was incised and stitched to the skin. The finger, which was introduced into the peritoneal cavity, came in contact with a freely movable and nodular tumor, which was supposed to be attached to the liver. Its size was fully as large as before the last operation. The incision was again filled with gauze, and four days later, adhesions having taken place, the tumor was incised, and about a quart of the same kind of fluid escaped through the wound. On digital exploration it was ascertained that the inner surface of the cyst was lined with mucous membrane, which was studded with polypoid growths. A large drainage-tube was inserted, and a Lister dressing applied.

During the next two weeks there was no febrile reaction, the tumor disappeared, and large quantities of the same clear fluid escaped through the fistulous opening. On October 10th the secretion had diminished greatly, and the tract had been reduced to the size of an ordinary lead-pencil. Injections of iodine were made with a view to hasten the obliteration of the cyst, but this procedure excited pain, emesis, and renewed secretion of fluid, of which from one-fourth to three-fourths of a quart were evacuated during twenty-four hours. Cauterization with nitrate of silver produced no better result. The skin remained in a state of maceration, wherever it was moistened by the secretion, in spite of often repeated changes of the dressings.

This peculiar condition of the skin first aroused the suspicion in Kulenkampff's mind that he was dealing with a fistula of the pancreas. He therefore collected some of the fluid and handed it to a chemist for analysis. The fluid was almost clear, colorless, frothing upon being shaken, slightly alkaline in reaction. It contained but few inorganic salts, and coagulated upon applying heat and nitric acid. It contained no succinic acid. Experiments were made to ascertain its effects on coagulated albumen, neutral fats, and starch, the substances being kept at a temperature of 20°–25° C. Special care was taken to preserve its alkaline reaction. A fresh paste, made of four grms. of wheaten flour and 50 grms. of water, was rendered very thin by the fluid. Fehling's test showed the presence of 0.96 grm. of glucose. Coagulated albumen of an egg, kept in a one-fourth per cent. solution of salicylic acid, showed no appreciable change; 0.195 grm. of leucin and tyrosin were obtained from it. Three decigrammes of freshly prepared lard were melted and subjected to the action of the fluid. A perfect emulsion was formed, which had not given off free fat after a lapse of twelve hours.

The chemical examination showed in 1000 parts:—

3.65 parts of albumen, which coagulated on addition of alcohol, and again was soluble in water.
8.57 " organic matter of various kinds.
8.09 " inorganic substances.

Kulenkampff is inclined to the belief that the traumatism caused some parts of the pancreas to become inflamed, thus causing a constriction or obliteration in the duct of Wirsung, or some of its branches. As long as the fistula continued to discharge, the patient became emaciated, but there was no disturbance of digestion. The urine at no time contained sugar. It was noticed that the secretion was more profuse during the afternoon. The patient recovered completely after the closure of the fistula.

Remarks.—This case illustrates well the difficulties which are met with in diagnosticating affections of the pancreas. Repeated examinations carefully made (direct exploration of the tumor) at the time of the second operation failed to throw sufficient light upon the case to enable the attending surgeon to make a positive diagnosis. The peculiar effect of the pancreatic juice upon the skin turned the attention of the operator in the right direction, and the chemical examination of the fluid, and the physiological tests to which it was subjected, finally resulted in a positive and correct conclusion.

In the next case the operator asserts to have made a probable diagnosis before the operation.

Case III. Gussenbauer's Case. (Zur Operativen Behandlung der Pankreascysten, *Archiv f. Klin. Chir.*, vol. xxix. p. 355.)—Male patient, musician, æt. 40, who has always been in good health, and not affected by any hereditary taint, was taken suddenly ill after having, on a festive occasion, indulged too freely in the pleasures of the table. He complained of nausea, acute pain in the stomach, and, after having taken more alcoholic stimulants to relieve the symptoms, he vomited repeatedly. In a few days he recovered from this attack and remained well for two weeks, when he discovered a swelling in the region of the stomach, which increased rapidly in size, so that after two weeks it caused a visible bulging in the epigastric region. The appetite now became impaired, the patient complaining of a sensation of fulness after meals, accompanied by frequent eructations. During the next month he vomited after meals and became greatly emaciated. The treatment resorted to had no effect in arresting the rapid growth of the tumor, which soon became the source of radiating pains through the lumbar and sacral regions.

When he was first seen by Gussenbauer, Dec. 21, 1882, about ten weeks after the illness had commenced, he was emaciated, skin pale, and of a dirty grayish-brown color. Respiration thoracic; pulse full and regular. Percussion showed slight dulness in the left side (sternal region), from the third rib downward; complete dulness from the fifth rib. In the mammary line slight dulness at the upper margin of the fourth, complete dulness from fifth rib downward; in the axillary region slight dulness over seventh, and complete dulness from eighth rib. On the left, slight dulness began at the upper margin of the third and extended to the eighth in the axillary line. Auscultation showed vesicular breathing on both sides of the chest. On examination of the abdomen a prominent swelling attracted the attention, which extended over the right and left supra-umbilical regions, and from the left costal arch into the right hypochondriac region. In the middle line the tumor measured $7\frac{2}{5}$ inches from the xiphoid cartilage to two inches below the umbilicus; from the left costal cartilage to the right hypochondrium, $8\frac{4}{5}$ inches. Over the anterior surface of the tumor, as far as it was not covered by the left lobe of the liver, percussion elicited clear, full, tympanitic resonance. If the abdominal wall were pressed against the tumor the percussion became dull. On inflating the stomach it could be seen rising above the tumor; its great curvature was easily mapped out by inspection and percussion. The transverse colon seemed to crop anteriorly over the middle of the tumor. It was movable only to a slight degree, and seemed to follow the respiratory movements. Tenderness on deep and firm pressure. No ascites. Bowels somewhat constipated, stools natural, with no admixture of fat. No abnormal constituents in urine. The rapid growth of the tumor and its location in the *bursa omentalis* behind the stomach and transverse colon led Gussenbauer to make a probable diagnosis of a cyst of the pancreas or the supra-renal capsule.

As the patient was in a critical condition, and all other measures had failed to afford relief, the only hope centred on a surgical operation, which was performed December 22, 1872. An incision was made in the linea alba about five inches in length, and the peritoneal cavity opened to the same extent. The stomach and great omentum were seen to cover the anterior surface of the tumor. The omentum was detached from the great curvature of the stomach for about three inches; several arteries were compressed temporarily and subsequently ligated. Through the omental incision the tumor came into view, covered by peritoneum. Fluctuation was now distinctly felt in the tumor. The upper and lower portions of the incision were closed, the parietal peritoneum was sutured to the external skin, and the anterior surface of the cyst to the margins of the wound. Through one of the punctures in the cyst wall a dark brown fluid escaped, and, as the suture was tied, the opening enlarged, and the fluid escaped in a jet. A part of the contents of the cyst were evacuated by means of a trocar, in order to diminish the intra-cystic pressure, and allow of a more perfect fixation of the cyst walls to the wound. When this had been done, an incision 1½ inches in length was made into the tumor, from which altogether about four pints of fluid escaped. Exploration of the interior of the cyst with the finger and sound indicated no traces of a solid tumor, but a smooth membrane lining the inner walls. The lower portion of the cyst walls was covered with black masses which were easily detached and removed without giving rise to bleeding. The cavity was washed out with a solution of thymol, a large drainage tube introduced, and iodoform dressing applied.

The fluid was of a grayish-black color, and contained in suspension large quantities of masses of pigment, a few red corpuscles in a state of degeneration, representing all forms of retrograde changes. The specific gravity of the fluid was 1.610, and its reaction alkaline. The dark color was due to the pigment which was found to be soluble in concentrated caustic soda, and in acid alcohol. Spectrum analysis showed the presence of hæmatin, but not of hæmoglobin. Further tests showed that it contained albumen, a body resembling mucin, and a material soluble in alcohol, but no bile pigment, metalbumen, peptones, or sugar. When the dressings were changed on the third day, the skin appeared to be macerated, which necessitated in the future a daily change of the dressing. The patient was relieved promptly by the operation, and the wound healed without suppuration. After a few days the discharge from the fistula became clear, and, upon examination, it was found to contain leucin and tyrosin. Its reaction was alkaline, it digested albumen, and converted starch into sugar. Patient made a good recovery, and was dismissed three weeks after the operation, with a small fistulous opening which continued to discharge a small amount of pancreatic fluid. During the time he was kept under observation the fistula closed several times, and each time he suffered from a rise in temperature which continued until the fistula opened and discharged again.

Remarks.—The origin of the cyst in this case was believed to be a hæmatoma of the pancreas. This assumption, however, lacks demonstration, and it is just as logical to assume that the cyst originated in the usual way from an obstruction, and that the blood in the cyst contents was an accidental product. The obstinacy of the fistula to close permanently would lead to the suspicion that the obstruction was of a permanent nature, either by the impaction of a calculus in the common duct, or obliteration of this channel by cicatricial contraction, the result of chronic inflammation.

The next three cases of cysts of the pancreas were mistaken for ovarian cysts, and the operation of ovariotomy was performed, when the nature of the cysts was discovered in one instance during the operation, and in the remaining two at the necropsy.

CASE IV. Bozeman's Case. (Removal of a cyst of the pancreas weighing twenty and a half pounds. *Medical Record*, January 14, 1872.)—The patient was a lady 41 years of age, and perfectly healthy up to seven years ago, with the exception of occasional attacks of indigestion. Seven years ago she experienced for the first time pain in the right iliac region, extending down the right thigh, and at times attended with numbness. Five years ago the abdomen began to enlarge upon the left side, with a corresponding flatness upon the right side. The swelling increased slowly up to six weeks ago, when it suddenly began to grow rapidly. Finally it filled symmetrically the entire abdominal cavity. At the same time the patient became emaciated and weak. Dr. T. G. Richardson, of New Orleans, who examined her at this time, diagnosticated the case as one of cystic tumor of one of the ovaries, and advised the patient to see Dr. Bozeman. The patient entered the Woman's Hospital in New York, Nov. 19, 1881, where she came under Dr. Bozeman's care. The previous diagnosis was confirmed by Drs. Bozeman, Thomas, and Emmet.

Dec. 2d an operation was performed for the removal of the supposed ovarian cyst. Full antiseptic precautions were observed before and during the operation. When the tumor was reached, through an incision below the umbilicus, its appearance was identical with that of an ordinary ovarian cyst, only that its color was of a more deep, pearly hue. With a trocar two and one-half gallons of fluid were evacuated. After the fluid had nearly escaped, about two-thirds of the cyst was drawn through the incision, and then, for the first time, the operator's suspicions were aroused that it was not ovarian. An exploration of the abdominal cavity revealed the presence of both ovaries in a healthy condition. The origin of the cyst was traced to the upper part of the abdomen. The incision was enlarged upwards two inches above the umbilicus. Further examination showed that the stomach had been crowded against the diaphragm by the tumor, while the intestines were displaced in the opposite direction. The cyst was found adherent to the transverse mesocolon. In tracing the cyst walls still further the pancreas was reached, where a large vein was discovered, which was very tortuous, and subsequently identified as the splenic. As this vein was in close relationship to the pedicle, its presence rendered the operation more difficult. The tail of the pancreas lay in contact with the side of the cyst wall, and firmly adherent to it to the extent of two inches. When this portion was separated, the organ spread out and presented its natural appearance. The cyst sprang from the pancreas at the junction of the outer third with the inner two-thirds, the pedicle being three-fourths of an inch in length, and about the same in thickness. The veins of the pedicle were very large. The pedicle was transfixed and secured in a double ligature and cut off. On examination of the cyst, it was discovered that a portion of it remained attached to the pedicle; this was subsequently completely removed by a careful dissection. The artery which supplied the cyst was as large as the brachial, and appeared to be a branch of the splenic. Very little bleeding attended the operation, and no ligatures were required.

The fluid removed was of a light brownish color, acid reaction, and a specific gravity of 1.020. Tumor and contents weighed twenty and a half pounds. Quinine, stimulants, and opiates were given after the operation. The highest temperature, 101.5° F., was noted on the third day, the pulse never rose above 98. After omitting the quinine, the temperature rose to 102.8° F. on the eighth day, when quinine in ten-grain doses every six hours reduced the temperature to nearly normal in the course of thirty-six hours. From this time the improvement continued uninterruptedly to the time when the patient was discharged cured on the thirty-eighth day.

CASE V. K. von Rokitansky's Case, reported by Zukowski. (Grosse Cyste des Pankreas. Laparotomie. Tod. *Wiener med. Presse*, Nov. 15, 1881.)—The patient was a female 36 years of age, who had suffered with symptoms indicative of ovarian cyst for nearly three years. The tumor was first noticed in the upper portion of the abdominal cavity. Laparotomy was performed Feb. 27, 1881. The usual incision was made in the linea alba, and the supposed ovarian cyst was found behind the great omentum, stomach, and transverse colon. The cyst-wall adhered firmly to the surrounding organs, and, on attempting to separate the adhesions between it and the transverse colon, a rent was made in the bowel four-fifths of an inch in length. The tear was at once closed with five sutures. The adhesions were so numerous, firm, and vascular, that complete extirpation of the entire cyst was found impossible, consequently the detached portion of the cyst was crushed off with an écraseur, and the stump fastened in the abdominal incision and the wound drained and closed. During the operation the cyst ruptured and a portion of its contents escaped into the peritoneal cavity. Fifty ligatures were applied in preventing and securing hemorrhage. After the operation the patient was in a collapsed condition and came near dying on the table. She rallied from the immediate effects of the operation, but died on the tenth day from suppurative peritonitis. Some time before death, fecal matter escaped through the opening left by the drainage tube. At the autopsy it was shown that the remaining portions of the cyst were connected with the pancreas. Of this organ only the head was found in a normal condition, of the body only a few remnants remained while the tail had disappeared completely.

Case VI. Luecke's Case. (Beitrag zur ovariotomie und zur Kenntniss der Abdominalgeschwülste. *Virchow's Archiv*, vol. xli. page 9.)—A female, 43 years old, with the exception of bronchial catarrh had always been in good health. In July, 1866, at the time when menstruation should have appeared she experienced a severe pain in the right hypochondriac region, where a swelling soon afterwards made its appearance. The tumor gradually increased in size and soon occupied the entire abdominal cavity. During the menstrual period the swelling always became tender and painful. She was admitted to the hospital under Luecke's care Nov. 29, of the same year, and then appeared pale and emaciated. She complained of difficulty in breathing, all other functions were unimpaired. The abdomen was symmetrically enlarged, its greatest circumference measured thirty-eight inches. The distance from the xiphoid cartilage to the umbilicus measured five and three-fifths inches; from the umbilicus to the pubis seven and one-fifth inches. Percussion revealed dulness over the middle of the abdomen as far as half way between the umbilicus and xiphoid cartilage. Lumbar regions tympanitic. An examination per vaginam and rectum showed that the uterus was displaced backward and toward the left side; upon its posterior surface a hard nodule could be felt. Tumor appeared to have no connection with uterus. On Dec. 1st menstruation set in with severe pain in the lower part of the abdomen. No change in temperature or pulse-rate.

Dec. 6th. The tumor was tapped at a point to the left of the median line, and twenty-three pints of a turbid, yellowish fluid were evacuated. After the tapping a movable tumor was felt in the left side of the abdominal cavity, which was regarded as the collapsed sac of the ovarian cyst. The fluid removed contained only a small amount of albumen. The microscopic examination showed the presence of large pale cells, some of them filled with granular matter. The condition of the patient was considerably improved by the tapping. Four days after the operation the cyst was again filling rapidly, and, on percussion, it seemed to occupy the middle of the abdomen, its upper margin being somewhat below the umbilicus. Dec. 22d. The labia majora and lower extremities were œdematous and the tumor was as large as before tapping. Jan. 1st, 1867, she suffered from a severe attack of dyspnœa during the night; at this time the area of dulness over the tumor had extended to within two inches of the ensiform cartilage, the umbilical depression was effaced, and the lumbar regions were resonant on percussion.

On the following day the patient was removed to a private dwelling where abdominal section was performed. After cutting through the skin and muscular layers in the linea alba, a thin, smooth, and very vascular membrane protruded through the wound. Through a small puncture which was made into this membrane a milk-white fluid escaped. A trocar was pushed through the membrane and a large amount of the same fluid poured out. On making traction upon the membrane the umbilical depression was restored. This circumstance, as well as the difficulty which was experienced in an attempt to separate the membrane, and the prolapse of the small intestine which now occurred, combined to prove that the supposed cyst-wall was the parietal peritoneum. The abdominal cavity was opened, and on exploration both ovaries were found normal in structure and position. The abdominal wound was closed with two rows of sutures. The fluid removed measured twenty-seven and a half pints and resembled milk in its gross appearance, it coagulated spontaneously and contained in suspension the same morphological elements as the fluid removed by tapping, with the exception that in addition numerous fat globules were found. The patient died Jan. 5th, the symptoms during her illness indicating diffuse peritonitis.

The post-mortem examination was made by Prof. Klebs. The intestines crowded upward, the transverse colon studded with numerous white or myxomatous nodules, very much contracted, forming a curve with the concavity directed upward, being separated from the stomach by a cyst with thin walls. The anterior wall of this cyst was made up of the lesser omentum. On opening the cyst a large quantity of fluid escaped, resembling in every particular the fluid which had been removed from the peritoneal cavity. The floor of the cyst was covered with nodules composed of grayish jelly-like masses. The principal portion of this material belonged to the pancreas. This organ had been transformed into a mass four inches in width, twelve inches in length, and was composed entirely of gelatinous nodules; in the centre of the mass the common duct could be identified. The mesentery contained numerous miliary nodules, and in Douglas's pouch large nodular masses were found. Left lateral ligament also contained gelatinous nodules. Remaining abdominal organs healthy. The microscopical appearances were characteristic of colloid cancer. The disease had evidently its primary origin in the pancreas.

Remarks.—Although this case does not properly come within the scope of this paper, it presents, however, a few important and interesting points which have a direct bearing on the subject before us. The disease was malignant from the beginning, and originated primarily either in the capsule or the parenchyma of the pancreas, and extended from there by continuity to the serous covering of the abdominal viscera. A cyst formed in the bursa omentalis anteriorly to the pancreas which had no direct communication with the peritoneal cavity. The walls of this cyst were made up of adjacent organs. The cyst occupying the same location as true retention cysts of the pancreas, gave rise to the same signs and symptoms. After the removal of the ascitic fluid the hydropic bursa omentalis remained and was displaced toward the left side, and thus simulated to perfection a movable cyst. Refilling of the cyst took place more rapidly than the accumulation of fluid in the peritoneal cavity. In a diagnostic point of view, the severity of the pain and the presence of nodules which were felt through the vagina and rectum should have aroused suspicion in regard to the benign character of the tumor, as their presence invariably indicate the existence of malignant disease.

In the following case the cyst of the pancreas was mistaken for an abscess:—

Case VII. Reported by Thiersch. (*Berliner Klin. Wochenschrift*, 1881, No. 40.)—A case of pancreatic fistula was admitted to the hospital with the following history: The patient, a stone-cutter, 38 years of age, in previous good health, was taken suddenly ill while at work. He complained of nausea and a sensation of great lassitude. A tumor developed in the region of the stomach. The rapidity with which the tumor appeared, and the distinct fluctuation which could be felt, led the attending physician to diagnosticate an abscess in the anterior abdominal wall. An incision was made to evacuate the contents of the abscess, but in place of finding pus, the operator, after cutting through the peritoneum, discovered a cystic tumor in the abdominal cavity. The wound was packed and incision of the cyst postponed until adhesions should form between the anterior surface of the tumor and the margins of the wound. Two and one-half weeks after the incision was made the cyst was laid open, and about three quarts of chocolate-colored fluid escaped. As the fistula which formed manifested no tendency to close, the patient sought relief in the hospital. The fistula secreted a moderate amount of a thin serous fluid. The chemical examination for pancreatic juice yielded a negative result. Thiersch dilated the fistulous tract, and ascertained by further examination that the tract was outside the parietal peritoneum, and reached as far as the spinal column and the tail of the pancreas. Thiersch was of the opinion that the cyst originated from a hæmatoma of the pancreas, and considered this the first case of recovery after such a lesion.

Remarks.—If the statement be correct that, at the first operation the peritoneal cavity was opened and the wound packed, and that the cyst was opened after firm adhesion had taken place, it is difficult to understand how the fistulous tract could be located outside of the peritoneal cavity, as Thiersch asserts. The location and rapid growth of the tumor as well as the condition found at the first operation would certainly indicate the presence of a true retention-cyst, complicated by hemorrhage from the beginning, or during the growth of the cyst. Although it is stated that the chemical examination of the fluid secreted yielded only a negative result, positive proof is lacking that it was not pancreatic juice, and we are entitled to the belief that the case was one of cyst of the pancreas, and the fistula a true pancreatic fistula.

In all cases reported so far, with the exception of the fatal cases, it had been impossible to learn the exact seat, nature, and cause of obstruction. For the purpose of throwing some light on this part of our subject, I will refer briefly to a few post-mortem specimens, which illustrate at least one variety of obstruction.

Prof. von Recklinghausen (Auserlesene Pathologisch-Anatomische Beobachtungen, *Virchow's Archiv*, vol. xxx. p. 360) gives the result of post-mortem examinations in two cases of cystic disease of the pancreas in patients who had died of diabetes mellitus.

The first case was a male, 40 years of age, who had suffered from diabetes mellitus for four years. The specific gravity of the urine was 1.030, and it contained from four to five per cent. of sugar. At the necropsy it was discovered that the pyloric end of the stomach was pushed forward by a large tumor, the lower portion of which was hidden behind the transverse mesocolon, which had been the seat of inflammation and cicatrization. The stomach was connected with the tumor by slight adhesions, but aside of a few hemorrhagic erosions beneath the mucous membrane, it showed no further signs of disease. Duodenum normal. Ductus choledochus permeable. Portal vein passed along the lower right margin of the tumor, where it was somewhat flattened and compressed. Splenic vein slightly dilated. Between the right border of the tumor and the duodenum the head of the pancreas could be seen presenting a healthy appearance, the common pancreatic duct was pervious at its duodenal extremity, and had not suffered any alterations in the head of the gland, but in the body it approached the tumor directly, and was no longer surrounded by gland tissue, but by dense connective tissue, which connected the head of the pancreas with the tumor. At the point where the duct terminated in the tumor its lumen was completely filled with a calculous concretion the size of a pea. The tumor was as large as a child's head, nearly round, and consisted of a dense sac, which contained a thin, yellowish fluid. In the fluid cholesterine and fat crystals could be seen with the naked eye. On standing, it deposited a white sediment, which, under the microscope, showed granular cells and debris of cells. The cyst wall was of uniform thickness, measuring about one-eighth of an inch. The section appeared somewhat gray, at some points interspersed with a white color. The inner surface of the cyst on the whole was smooth, with isolated thickened patches resembling the sclerotic patches in atheromatous arteries. At some points the inner surface is somewhat elevated by thick membranes of a pearly glistening appearance and gray color, which could be easily detached. The surface underneath these membranous patches was somewhat rough. Upon the inner and posterior walls of the cyst a groove could be distinctly traced from left to right, which, at its left extremity, terminated in a canal the size of a crow's quill, perforating the cyst wall. On tracing this canal beyond the wall of the sac it was found to dilate, its lining being white and smooth, and, at some points, being thrown into transverse folds. The tail of the pancreas, which contained this duct, was indurated and sclerosed, containing no well-marked acini, but it had retained its glandular structure. The terminal blind end of the duct, much dilated, was surrounded by dense connective tissue. The length of the duct from the sac to its termination measured two inches. The right extremity of the groove terminated in a second opening, through which a probe one-eighth of an inch in diameter could be passed directly into the common duct in the head of the pancreas after passing the concretion which filled the duct. Between the tail and head of the pancreas the glandular tissue had entirely disappeared, and its space to the extent of two and one-half inches was taken up by the posterior wall of the cyst, which rested directly against the soft tissues between it and the vertebral column. The large vessels behind the tumor were not adherent, and in no wise affected by the tumor. In his remarks on the origin of this cyst, the author expressed his belief that it was caused by dilatation of the ductus Wirsungianus from obstruction to the free outflow of the pancreatic secretion by the calculus. The lungs and intestines were the seat of extensive tubercular disease.

Remarks.—The specimen just described illustrates an important lesson in pathology, viz., that long-continued obstruction will eventually result in total destruction of the anatomical structure and physiological function of the organ, or part of organ, beyond the point of obstruction. This fact has a direct practical bearing on the question of treating a cyst of the pancreas by the formation of a pancreatic fistula. The definite closure of the fistula would be prevented if the distal portion of the gland tissue remained intact and the obstruction to its outflow remained permanently. Clinical experience and pathological specimens, however, tend to prove that the enormous distension and pressure produced by these cysts, as well as the etiological conditions which produce them, result in almost complete obstruction of the secreting structures in the immediate vicinity of the cysts and the distal portion of the gland, which is equivalent to cessation of the secretory function of that portion of the organ.

The second specimen described by von Recklinghausen was obtained from a male, aged 26 years, who also died of diabetes. The lungs, pleura, and intestinal canal revealed the presence of tubercular lesions. The pancreas had undergone fatty degeneration, so that only its head contained remnants of healthy glandular tissue. The common duct in the head of the organ was found dilated, and presented a varicose appearance. It contained a tenacious whitish fluid in which were suspended small calculous fragments, composed of carbonate and phosphate of lime. In addition, the duct contained two calculi, of which one measured one inch in length and three-eighths of an inch in thickness; the second, still larger in size, was one and one-third of an inch long and of the same thickness. Both of these stones presented depressions and elevations on their surfaces which corresponded to the irregularities of that portion of the duct in which they were lodged. The common duct in the body and tail of the organ was dilated, its walls much thickened. The same changes were observed in the accessory ducts which could be traced through the fatty tissue where they were seen to terminate in white strings of connective tissue. The distal ends of the smaller ducts contained mucous and fine calculous concretions.

Remarks.—In this instance, the dilatation of the duct did not proceed to any great extent on account of the fatty degeneration of the organ, which probably occurred *pari passu* with the formation of the cause of obstruction, consequently the physiological activity of the gland was abolished, and no pancreatic juice was secreted behind the seat of impaction. The presence of the adipose tissue which preserved the shape and size of the organ is attributed by the author to a hypertrophy of the interstitial and adipose tissue rather than to a fatty degeneration of the secretory elements of the gland.

Topographical Anatomy of the Pancreas.—For a correct interpretation of the signs and symptoms of cysts of the pancreas, and for an accurate understanding of the relations of this organ to surrounding parts in their surgical treatment, it becomes necessary to refer briefly to the topographical anatomy of the pancreas.

The pancreas is a tongue-shaped gland placed transversely in the abdomen at a point opposite the first lumbar vertebra behind the stomach, reaching from the hilus of the spleen to the concavity of the duodenum. Its right end, termed the head, is embraced by the curvature of the duodenum, whilst its left or caudal extremity is in contact with the spleen. After opening the abdominal cavity in cadavers it can be distinctly felt as a firm body through the walls of the stomach. The organ is made accessible and exposed to sight by cutting the ligamentum gastro-colicum transversely, and by pushing the stomach upward and the transverse colon downward. In the saccus epiploicus, which has now been opened, the gland is seen in front of the large vessels. It presents three surfaces for examination. The anterior surface, somewhat concave, is in contact with the stomach throughout its entire extent, but separated from it by a covering from the omental bursa, which renders the surface smooth and well adapted for the free movements of the stomach. The posterior surface is separated from the spine by the vena cava, aorta, the superior mesenteric artery and vein, the pillars of the diaphragm, and toward the liver, the vena porta as well as numerous lymphatic vessels and glands, all of which are firmly connected with this surface and the spine by connective tissue. To the left of the vertebral column it is attached in the same manner to the left supra-renal capsule, kidney, and renal vessels. The superior mesenteric artery and vein are embraced by the substance of the gland, so as sometimes to inclose these vessels in a complete canal.

The inferior surface is narrow and directed toward the transverse colon, it rests at one end on the junction of the duodenum and jejunum; at the left end on the extremity of the transverse colon. The intervening middle portion of the inferior surface has a special peritoneal covering derived from the lower layer of the mesocolon. Along the posterior surface and upper border of the gland are placed the splenic artery and vein, both pursuing a tortuous course from right to left.

The cœliac axis is above the pancreas. The common bile-duct is in close relation to the head of the gland passing down along its posterior surface, and is generally received into a groove or canal in its substance. The common pancreatic duct, or canal of Wirsung, is widest near its entrance into the duodenum, where it is from one-twelfth to one-ninth of an inch in diameter. Before its termination it unites with the common bile-duct in the wall of the intestine, at the junction of the second and third portions of the duodenum, between three and four inches below the pyloric orifice of the stomach. The lower extremity of the head, where it curves behind the mesenteric artery and vein, is sometimes marked off from the rest, and is then called the *lesser pancreas*, with a special duct which joins the common duct in the substance of the head of the pancreas.

The pancreas receives its blood supply from the superior and inferior pancreatico-duodenal branches of the hepatic and superior mesenteric arteries. The venous return takes place through the splenic and superior mesenteric veins.

The nerves are derived from the solar plexus.

Accessory Pancreas.—The pancreas, like many other glandular organs, sometimes presents rudimentary duplicities, and it is necessary to call attention to this fact for the purpose of considering the possibility of the origin of a pancreatic cyst from one of these appendages.

Rokitansky (Nebenpancreas in der Darmwand, *Virchow's Archiv*, vol. xxi. p. 369) mentions as an exceedingly rare occurrence duplicity of the pancreas and excessive development of accessory appendages. A frequent variety is represented by the head of the gland, the *pancreas minus*, the duct of which usually terminates in the common duct, but sometimes, as was first ascertained by Winslow, it takes an independent course and empties into the duodenum about one to one and a half inches below the opening of the common duct. More recently Hyrtl has called attention to an accessory pancreas consisting of a few isolated acini of the gland behind the superior mesenteric artery and vein. Klob has described an accessory pancreas distant and distinct from the normal organ, which was found between the muscular layers of the stomach about the middle of the great curvature. On another occasion he found a similar organ in the posterior wall of the jejunum, near its upper termination. In both instances the true glandular structure of these bodies was confirmed by microscopical examinations.

Zenker met with six instances of supernumerary pancreas. The accessory organ was invariably in the walls of the intestine, three times in the highest convolution of the jejunum, twice near the duodenum, and in the last case in the upper portion of this part of the intestinal tract. In size, the glands varied from a lentil to a silver dollar. They were situated between the intestinal tunics and presented a prominence on the serous surface. Klob found no excretory duct in his specimens. Zenker detected the terminal end upon the mucous surface of the intestinal canal in the shape of a slightly-raised papilla, which could be seen with the naked eye, or by means of a magnifying glass. The presence of pancreatic juice in the glands was also determined. In all instances the gland proper was found in its normal location and of natural size. All patients were adults.

Like other accessory organs, the supernumerary pancreatic glands owe their origin to embryonal deposits of gland tissue. Although as yet no instance has been observed of cystic formation from an accessory pancreas, there is no reason to doubt why such an occurrence should not take place, for the same reason and in the same manner as has been observed in cases of cysts from supernumerary thyroid glands.

Pathology and Morbid Anatomy.—Cysts in the pancreas always result from retention of its secretion, and subsequent dilatation of the secretory duct, or in case of laceration of this structure, from extravasation of the secretion into the parenchyma of the gland and subsequent distension of its capsule. The size of the cyst is modified by the character and seat of the obstruction and its relative position to the secreting gland structure. The walls of the cyst are usually thin, from overdistension, in cases of rapidly-growing cysts, or much thickened when the growth of the tumor has been slow and accompanied by chronic proliferation and induration of the connective tissue. The cyst walls in chronic cases may become cartilaginous or even ossified. The inner surface is either smooth or it presents evidences of degeneration similar to those which occur on the internal surface of arteries in the later stages of endarteritis. If the canal of Wirsung is obstructed at or near its proximal end the entire duct and its branches may become dilated, presenting the appearance of varicose veins, or a more uniformly rounded cyst may form of the size of an orange, of a child's head, or even so large as to occupy the whole abdominal cavity, as in Bozeman's case. As the cyst increases in size the gland-structure disappears by absorption in consequence of intra-cystic pressure. The same cause which constitutes the obstruction will often lead to destruction of the parenchyma of the organ by inducing a chronic interstitial pancreatitis, which is followed by cirrhosis or fatty degeneration of the organ. Virchow (*Die Kranhaften Geschwülste*, vol. i. p. 276) alludes to cysts of the pancreas under the name of *ranula pancreatica*, and describes two essential and distinct varieties. In the first class the entire duct is found dilated and resembles in appearance a rosary. In the second variety the outlet of the excretory duct is obstructed, and behind the seat of obstruction the duct undergoes cystic dilatation. He mentions a case that came under his observation where such a cyst had attained the size of a fist. (Ueber die Leucin u. Tyrosin Abscheidung an der Leber. *Virchow's Archiv*, vol. viii. pp. 360, 361.) He believes that cicatricial contractions or pressure of tumors upon the duct constitute the most frequent source of obstruction. Pancreatic juice in its purity is only found in small and recent cysts; later on, in old or large cysts various accidental products are added. Albuminoid degeneration or suppuration not unfrequently takes place, or hemorrhage may occur, so that the cyst contents assume a bright red or chocolate-colored appearance. Pepper found in such a cyst numerous crystals of hæmatoidin, while Hoppe found, in another instance, urea in the proportion of 0.12 per cent. as one of the constituents of the contents of the cyst. The pressure of the cyst upon neighboring organs will result in secondary pathological conditions which will interfere with the physiological functions of other organs, thus endangering the life of the patient.

Ætiology.—The causes which result in the formation of small cysts of the pancreas or cysts which result from compression by tumors, which in themselves do not admit of an operation for their removal, and at the same time constitute a source of danger to life, do not come within the scope of this paper. In the latter instance the cyst is simply a sequence of the primary cause, and, as such, it will seldom, if ever, become the sole or direct object of surgical treatment. The causes of retention in cysts amenable to operative treatment are such which in themselves do not imperil the life of the patient. They may be classified as follows:—

1. Obstruction to the outflow of the secretion from impaction of calculi in the common duct or its branches.

2. Partial or complete obliteration of a portion of the duct from cicatricial contraction.

3. Sudden or gradual obstruction of the duct without diminution of its lumen from displacements of the pancreas.

1. *Calculi.*—The impaction of the pancreatic duct at its outlet may be caused by the presence of a biliary calculus in the ductus communis choledochus at the junction of the former with the latter. A case of this kind has been reported by Engel. (*Oesterr. Med. Jahrb.*, vol. xxiii. and xxiv. 1841). In such the obstruction gives rise to retention of the secretions from the liver and the pancreas, and dilatation of the excretory ducts in both organs. Calculous concretions in the pancreatic ducts have been frequently observed to give rise to retention cysts. Johnston (Calculous and other affections of the Pancreatic Ducts, *Am. Jour. Med. Sciences*, Oct. 1883) has collected thirty-five cases in which, upon post-mortem examination, stony concretions were found in the pancreas. Incrustations are not as frequent as free concretions. Gendrin has described a pancreatic cyst where the normal pancreatic secretion was converted into a fatty, chalky pap. The causes which produce a concretion in the pan-

creatic duct are chemical changes in the secretion itself, or an obstruction to its free exit by inflammatory changes in or around the common duct. The degree of dilatation, other things being equal, is in direct proportion to the completeness of the obstruction to the outflow of the secretion. It may be well to allude to the possibility that in some instances a pancreatic calculus may remain stationary for an indefinite period of time in the duct, giving rise to no symptoms and only partial obstruction, until, by the action of some determining cause, it is forced into a position where it effects complete mechanical obstruction to the outflow of the fluid and a rapid increase in the size of the cyst. As an impacted biliary calculus may give rise to pancreatic obstruction, so a pancreatic calculus, when it is impacted at a point where compression of the common bile-duct can take place, will produce icterus and dilatation of the gall-bladder and bile-ducts. Meckel has reported such a case. (Koreff,-Diss., Sistens theoreticam considerationem icteri novis quibusdam causis simul superstructam. Halle, 1763.)

Among the specimens of pancreatic cysts so far examined which were caused by concretions, none of them had attained the size of those which have been submitted to surgical treatment. As in most of these preparations, the calculi did not completely fill the calibre of the duct, they caused only partial obstruction, which would furnish an explanation of the slow growth and comparatively small size of the tumor. In the specimen described by Gould (Anatomical Museum of the Boston Society, Boston, 1847, p. 174), it appears that the common duct was completely closed by two calculous concretions at its entrance into the duodenum, and this cyst had attained considerable size, in fact, it is the largest cyst on record, where it was proved that the dilatation was caused by the presence of a calculus. As in the successful operations on cysts of the pancreas, it has been impossible to ascertain the exact nature of the obstruction, the possibility of retention from a calculous cannot be eliminated with certainty.

2. *Cicatricial Contraction.*—Cicatricial contraction is always the result of the antecedent inflammation. The cicatrix may be located in the peripancreatic tissue or in the substance of the gland itself. Hoppe (Ueber einen abnormen, Harnstoff enthaltenden pancreatischen Saft vom Menschen, *Virchow's Archiv*, vol. ii. p. 96) made a post-mortem examination of a patient who had been deeply jaundiced during life. The gall-bladder and bile-ducts were distended with bile which contained blood, the pancreatic duct was also cylindrically dilated, and many of its branches were distended into cysts the size of a hazelnut. The cause of retention of both secretions was found in a dense cicatrix which surrounded both ducts at their duodenal termination. Interstitial inflammation in the gland itself and subsequent cicatricial contraction is one of the most frequent causes of retention. Wyss has reported a case where the interstitial inflammation was limited to portions of the head of the pancreas through

which the common bile-duct and the ductus Wirsunganus passed, and which had resulted in dilatation of the latter and its branches which again compressed the bile-duct, producing in this manner intense icterus. (Zur Aetiologie des Stauungsicterus, *Virchow's Archiv*, vol. xxxvi. p. 455.) Bécourt has given a description of a similar specimen (Recherches sur le Pancréas, Strassburg, 1830), which he found in the Strassburg Pathological Museum. The patient had died of icterus. The gall-bladder and bile-ducts were found distended, the pancreas was converted into a dense tissue which, being cut into, presented a chalky deposit four to eight inches in length and of a yellowish color. The duct of Wirsung was dilated to such an extent as to form a large cyst which occupied the whole length of the pancreas, its walls being inseparable from the substance of the gland. In this case the interstitial inflammation was more extensive and the cyst much larger. In the case reported by Pepper and Hjelt the obstruction was due to the same cause. In Curnow's case the common duct had become obliterated at its entrance into the duodenum by catarrhal inflammation. The pancreas was atrophic and its duct was filled with numerous calculi. The pancreatic juice had become inspissated. The cystic duct of the gall-bladder was impermeable, while in the common bile-duct a number of small gall-stones were found (*Trans. of the Path. Society of London*, vol. xxiv.). I have failed to find in the literature an allusion to stricture of the duct, the result of traumatism. The pancreas is an exceedingly slender organ and somewhat friable texture, and hence, although remotely located and well protected by surrounding organs, I am of the opinion that it is more frequently the seat of injury than has been generally supposed. If the stomach be empty and the abdominal muscles relaxed, a blow over the region of the pancreas may result in a serious contusion or laceration of the organ without rupture of its envelope. Again, a well-directed blow over either extremity of the gland may cause a laceration of the tissues by traction force, the organ being securely fixed in its place by firm connective-tissue attachments. The clinical history of several cases of rapidly growing cysts tends to prove that obstruction occurred in this manner. If the duct escape injury, the cicatricial contraction attending and following the reparative process in the lacerated gland tissue will gradually compress the duct, or by lateral traction change its direction. If the duct be ruptured at the time of injury its lumen may become completely filled by a thrombus which renders it impermeable, giving rise to retention and extravasation of the secretion primarily, and secondarily to definitive occlusion of the duct by cicatricial contraction at the point of injury. I am quite convinced that in the case which I have reported the retention was the direct result of traumatic stricture of the common duct. Although this view is not supported by evidence from post-mortem examinations, it is confirmed by analogous production of cysts in other locations. It is evident that this class of cases would furnish the most favorable conditions for successful surgical treatment.

3. *Obstruction from Displacement of the Pancreas.*—As the pancreas is retained in its normal transverse position by the surrounding organs and connective-tissue attachments, a relative change of position of portions of the gland would result in a bending of the organ and obstruction in the duct at the point of flexion. This condition was the cause of retention in a case related by Engel (*op. cit.*), who found in a woman sixty years of age that the tail of the pancreas formed a right angle upward with the principal duct of the gland. A dislocation of this kind can occur in one of the following ways:—

1. Abnormal relaxation of the connective-tissue attachments of the gland permitting a portion of the organ to descend by its own weight lower in the abdominal cavity.
2. Pressure upon the gland by tumors or exudations.
3. Cicatricial contraction in the substance of the organ or the peripancreatic space.

That the whole pancreas can become displaced is proved by the case reported by Dobrzycki. (Fall von beweglicher Bauchspeicheldrüse, *Virchow u. Hirsch's Jahresb.*, 1878, vol. ii. p. 215.) A man, 50 years of age, fell from a distance of some yards; symptoms arising after the fall similar to those of a floating kidney. By palpation the displaced organ could be located. Saline fluid which was vomited resembled pancreatic juice. In the hypogastrium a movable tumor could be felt, corresponding in position and shape to the pancreas.

Diagnosis.—The question of diagnosis can only be entertained in cases where the cyst has attained very considerable proportions. The most important points to be taken into consideration are the history of the case, and the anatomical location of the tumor and its relations to the surrounding organs. The cases which have been reported have occurred exclusively in adults. Sex appears to exert no determining influence. In a number of cases the clinical history alludes distinctly and forcibly to traumatism as the exciting cause. In Gussenbauer's case the beginning of the illness was traced to indiscreet eating and drinking. In all instances of cystic tumors in the region of the pancreas close inquiry should be made to ascertain the existence of antecedent inflammatory affections of the organ, or in its immediate vicinity. A history pointing toward the existence of biliary or pancreatic calculi will also prove valuable in arriving at positive conclusions. Rapid growth of the tumor speaks in favor of its pancreatic origin. In Gussenbauer's, Kulenkampff's, and my own case the tumor attained an enormous size within a few weeks. Considering the relations of these cysts to important surrounding organs it is remarkable that they give rise to no serious symptoms aside from the pressure they exert upon adjacent organs. Pain is not a constant symptom, and when it is present it is due more to the causes which produce the cyst than to the cyst itself. In this respect cysts of the pancreas form a counterpart to malignant disease when it affects this or neighboring organs. Emaciation is due either to a coexisting affection of the gland, or the impairment of function of important organs by pressure of the cyst. It is never as marked in these cases as in malignant disease. The supervention of fatty stools would point toward the existence of some coexisting serious lesion of the pancreas rather than the existence of a simple cyst of the organ. This symptom was not found present, or it was overlooked in all cases which have been operated upon. Of twenty-eight cases of stearrhœa, which were compiled by Ancelet (*Études sur les Maladies du Pancréas*, Paris, 1867) sixteen were examined post-mortem. In five of these cases there was occlusion of the ductus choledochus and pancreaticus, in three occlusion of the pancreatic duct alone. In one there existed a carcinoma of the pancreas, in one inflammation of the pancreas and some of the adjacent organs. In the remaining cases disease of the liver, the bowels, or only marasmus was found. In thirteen cases of pancreatic calculi collected by Johnston (*op. cit.*), only three fatty stools were observed; in six cases diarrhœa; in four cases malæna; and constipation in the remaining six. The presence of fat in the stools is a symptom of great importance in the recognition of pancreatic disease, but that it is not of absolute diagnostic significance is proved by the well-known fact, that the same condition will follow upon the obstruction of the biliary passages and other affections which impair the functional activity of other organs of digestion.

Obstruction of the principal duct impairs digestion more than when its distal extremity, or one of the accessory ducts is involved. The actual illness of the patient is usually preceded for a variable length of time by more or less marked symptoms of gastro-intestinal derangement, accompanied in some instances by pain in the region of the pancreas.

A peculiar color of the skin, which is believed by some to be characteristic of pancreatic disease, must be mentioned, as it was observed in several cases of calculous affection and cysts of the pancreas. The appearance presented by these patients is variably described as being unhealthy, pale-yellow, dirty, or earthy. The intimate relations of the cyst to the cœliac plexus will explain the cause of cœliac neuralgia which is met with in some of these cases. Atrophy of the cœliac plexus from long-continued pressure may give rise to mellituria for the same reason that Klebs has affirmed that partial extirpation or atrophy of the cœliac plexus will cause the presence of sugar in the urine. Diverse diseases of the pancreas have also been known to produce diabetes mellitus. Cases of this kind have been reported by Cowley (1788), Bright, Elliotson, Frerichs, Fles, Hartsen, Silver, Recklinghausen, Munk, Seegen, and Friedreich. Klebs demonstrated by his experiments that complete extirpation of the pancreas or ligature of its duct invariably gave negative results, as far as diabetes was concerned, and this may account for the fact that no sugar was found in the urine in the cases reported in this paper. The cyst when examined early, before it has attained considerable size, is always found in the region normally occupied by the pancreas. The exact location, however, is not always uniform, as it will depend upon the portion of the pancreas from which the cyst has taken its primary origin. It may be situated below the right lobe of the liver, as in Kulenkampff's case, in the epigastric region, as in Gussenbauer's case, or in the left hypochondrium, as noted in my case. When the tumor has attained a large size, or occupies the whole abdominal cavity, it will be difficult, and in the latter case impossible, to determine by any known means its primary origin. In such cases it is of paramount importance to study its relations to adjacent organs. The tumor is always and invariably situated in the *bursa omentalis*, and from this point as it increases in size it encroaches upon the space occupied by adjacent organs. The stomach is pushed forward in all cases, and later to the right. The transverse colon is displaced downward, the spleen to the left, and the diaphragm and contents of the chest upward. The cyst being in direct contact with the diaphragm it usually ascends and descends with the respiratory movement of the chest.

In doubtful cases it will become necessary to inflate the stomach and colon, with a view to ascertain their relative position to the cyst. If the patient be a female, and the tumor occupy the entire abdominal cavity, it will simulate cystic disease of the ovary so closely that a differential diagnosis between the two is impossible. The cases reported by Luecke, Bozeman, and Rokitansky furnish adequate proof of the correctness of this statement. The proximity of the abdominal aorta is such that the impulse of the artery is imparted to the tumor which, however, pulsates only in one direction—away from the artery—a fact which will always distinguish it from an aneurism. Unless the cyst is exceedingly tense, a sense of fluctuation is always imparted by palpation. Palpation is rendered difficult on account of the deep location of the pancreas and the rigidity of the recti abdominis muscles. The normal pancreas can only be felt under certain favorable conditions. Concerning this point, Sir William Jenner says: "By deeply depressing the abdominal walls about a hand's breadth below the umbilicus, by then rolling the subjacent parts under the hand (the stomach and colon must be empty), it might be possible to detect it in an individual who is thin, and whose tissues are lax." In case the examination is rendered difficult, on account of great rigidity of the abdominal muscles, this obstacle can be overcome by examining the patient while under the influence of an anæsthetic. An exploratory puncture with a fine and perfectly aseptic needle of a hypodermic syringe will not only add material diagnostic information by revealing the character of the cyst contents, but the procedure will also settle the question as to the existence or absence of adhesions between the cyst walls and the parietal peritoneum.

In the differential diagnosis the following affections will come up for consideration :—

1. Malignant disease of the pancreas or adjacent organs.
2. Aneurism.
3. Echinococcus of liver, spleen or peritoneum.
4. Affections of retro-peritoneal lymphatic glands.
5. Hydro, or pyo-nephrosis.
6. Cystic disease of supra-renal capsule.
7. Circumscribed peritonitis with exudation.
8. Ascites.
9. Cystic disease of ovary.

1. *Malignant Disease of the Pancreas or Adjacent Organs.*—Carcinoma or sarcoma of the pancreas or adjacent organs as in every other locality always manifest their presence by their most characteristic clinical features, pain, emaciation, and progressive local and general infection. The age of the patient and the previous history of the case will also furnish important diagnostic information. Large pancreatic cysts are unilocular, while on the other hand, if a malignant tumor has undergone cystic degeneration, usually more than one cyst can be recognized. Hardness and irregularity of surface speak in favor of malignancy; on the other hand, smoothness, and a regular round or oval contour of the tumor are constant features of a pancreatic cyst. The time which has elapsed since the beginning of the illness is also of importance. A rapidly growing pancreatic cyst will assume a size in two or three weeks which even for a malignant tumor would require as many months.

2. *Aneurism* of the abdominal aorta can be distinguished from a pulsating pancreatic cyst by its pulsations being felt in all directions and by the presence of a bruit. As a further test, the suggestion of Dr. Pepper may be resorted to, which consists in placing the patient in the genu-pectoral position, when the tumor by gravitation will leave the aorta and all pulsations will cease. Steady pressure will diminish the volume of an aneurism but will have no effect on a cyst of the pancreas.

3. *Echinococcus cysts* of the liver, spleen, or peritoneum could be easily mistaken for a cyst of the pancreas. The peculiar fremitus sometimes felt on palpating an echinococcus cyst should always be sought for. Multiplicity of cysts would decide in favor of something else than a pancreatic cyst. The presence of hooklets in the aspirated fluid would furnish positive evidence in favor of the presence of an echinococcus cyst, while their absence would not exclude the possibility of the tumor being a sterile echinococcus cyst. As the surgical treatment in both instances would be identical, it is sufficient for practical purposes to narrow the diagnosis down to a probable existence of either affection.

4. *Affections of Retro-peritoneal Lymphatic Glands.*—Neoplasms, inflammation, suppuration, or hypertrophy of the retro-peritoneal glands behind the pancreas might simulate a pancreatic cyst, and as a wrong diagnosis in such an event might prove disastrous to the patient and reflect discredit upon the surgeon every diagnostic resource should be exhausted in order to prevent such error. Enlargement of the lymphatic glands from any cause, sufficient in extent to simulate a pancreatic cyst, would almost of necessity give rise to serious constitutional disturbances and extension of the disease to neighboring organs.

5. *Hydro- or Pyo-Nephrosis.*—In hydro- or pyo-nephrosis the early clinical history will present a group of symptoms pointing toward some lesion in the pelvis of the kidney or ureter. A chemical and microscopical examination of the urine may furnish conclusive evidence of the existence of some renal affection which has produced the obstruction. Tumors of the kidney usually occupy a lower place, and are more laterally located than tumors originating in the pancreas. In case of a pancreatic cyst the lumbar region below the kidney is tympanitic, which is not the case in hydro- or pyo-nephrosis. In case of doubt an exploratory puncture may enable us to arrive at a positive conclusion.

6. *Cystic Disease of the Supra-renal Capsule.*—The supra-renal capsule may be the seat of cystic degeneration and simulate a cyst of the pancreas so closely that a differential diagnosis is impossible. In Gussenbauer's case the diagnosis remained doubtful between a cyst of the pancreas and a cyst of the supra-renal capsule. The bronzed skin, so frequently observed in diseases of the supra-renal capsule has been also seen in affections of the pancreas. As the operative treatment in either case would be the same, it is not essential, for practical purposes, to make a positive diagnostic distinction between the two.

7. *Circumscribed Peritonitis, with Exudation.*—Primary peritonitis with a circumscribed exudation in the region of the pancreas would reveal a history pointing toward an inflammatory affection accompanied by the usual symptoms attending inflammation of this membrane. Fever, pain, and tenderness are symptoms which are either foreign to the history of cysts of the pancreas, or, when present, they are less intense than in peritoneal inflammation. In peritonitis the exudation would be necessarily in the peritoneal cavity, while pancreatic cysts always occupy the omental bursa.

8. *Ascites.*—The question of diagnosis between a cyst of the pancreas and ascites can only arise in case the whole abdominal cavity is distended by the tumor or effusion. The causes which produce ascites must be considered separately and individually, as they are usually of such a character as to exclude a suspicion of pancreatic disease a satisfactory diagnosis can be reached without an exploratory puncture, but if any doubt remain this harmless procedure will furnish the requisite information.

9. *Cystic Disease of Ovary.*—From the cases reported we have gleaned that in at least three cases, large cysts of the pancreas were mistaken for cystic disease of the ovary by surgeons of prominence and ability who made thorough and repeated examinations. It is not difficult to conceive that in case the tumor has assumed such dimensions as to fill the entire abdominal cavity, it would be impossible to differentiate between a cyst of the pancreas and the ovary, even by a most scrutinizing examination. The physical signs presented by either, resemble each other so closely that they cannot be relied upon in discriminating one from the other. The early history of the case, if it can be obtained from a reliable source, is of more diagnostic value. In pancreatic cysts the early symptoms are usually referred to disturbance of the digestive functions, and the patient has been aware of the presence of a tumor in the upper portion of the abdominal cavity. An ovarian tumor necessarily begins in the opposite portion of the abdominal cavity, and gives rise to pelvic distress and disturbance of the menstrual function. As the surgical treatment in both instances would be the same, it is practically not essential to make a positive distinction between the two, before an exploratory incision will reveal the true nature and origin of the cyst.

In recapitulation, it may be stated that a positive diagnosis has so far not been made in a single instance, and that for all practical purposes it is only essential to make a probable diagnosis between a pancreatic cyst or some other kind of a cyst which would call for the same kind of surgical treatment. In very obscure cases an exploratory incision under antiseptic precautions for diagnostic purposes is a justifiable procedure.

Prognosis.—Physiologists are agreed in assigning to the pancreas a most important function in the digestion of organic food. We know that by a special ferment it assists in the transformation of starch into dextrine and sugar, and in the digestion of albumens and fat. We should naturally expect that in diseases of this organ the digestion of the substances would be impaired in proportion to the amount of gland tissue destroyed. On the other hand, we have abundant evidence to show that even total disorganization or destruction of the pancreas is not incompatible with normal digestion and perfect health. It would seem to appear that in the absence of the pancreatic secretion other organs assume a vicarious action, and digestion proceeds unimpaired. It is also important to remember, that even a large cyst of the pancreas does not necessarily result in extensive destruction of the gland, and that the remaining gland tissue continues to secrete and discharge a sufficient amount of pancreatic juice. In Bozeman's case the cyst occupied the entire abdominal cavity, and yet, at the operation the greater portion of the gland was found healthy in structure. The integrity of the structure and function of the gland depend less on the presence of the cyst than the causes which were concerned in its production.

The dangers arising from the cyst itself consist in: 1. Its interference with the functions of other abdominal organs by pressure. 2. Rupture of cyst and escape of its contents into adjacent hollow organs or peritoneal cavity. Compression of the stomach and interference with its normal peristaltic action, is a constant occurrence when the cyst has developed to any considerable size. When such is the case, vomiting soon after meals takes place, as was noted in a number of cases which have been reported. When the cyst is of very large size most all of the abdominal organs suffer by compression, and both digestion and absorption are impaired by mechanical pressure. The diaphragm being at the same time pushed upward, the heart and lungs are displaced in the same direction, and embarrassment of circulation and respiration follows as a necessary sequence. Like any other benign abdominal tumor the cyst proves dangerous to life by interfering mechanically with the functions of more essential and important organs.

The second source of danger is rupture of the cyst and escape of its contents into adjacent organs, an accident which may be followed by immediate death from hemorrhage, or the life of the patient is placed in jeopardy by suppurative inflammation in the interior of the cyst, or peritonitis, in case the contents have escaped into the peritoneal cavity. In Pepper's case, the immediate cause of death was hemorrhage consequent upon rupture of the cyst into the stomach (AMERICAN JOURNAL OF THE MEDICAL SCIENCES, 1871, p. 159). At the post-mortem examination a large amount of blood was found in the stomach and intestine, which had entered through an opening about one-half an inch in diameter, close to the proximal termination of the ductus communis. A probe passed through this opening directly entered a cyst in the head of the pancreas. A communication with any portion of the gastro-intestinal tract would almost of necessity lead to infection and suppurative inflammation in the interior of the cyst, which, under unfavorable circumstances, might lead to a fatal termination from septicæmia or extension of inflammation to adjacent organs. The prognosis may be said to depend: 1. On the nature and cause of obstruction. 2. Size of cyst. 3. The absence or presence of complications.

Treatment.—In the treatment of a pancreatic cyst, the indications are the same as in the treatment of any other kind of cyst, viz.: 1. Extirpation of the cyst. 2. Evacuation of its contents and obliteration of the cyst. Extirpation was attempted in Bozeman's and Rokitansky's cases; in the former instance with complete success; in the latter the operation was not completed, and the patient died a few days afterwards of septic peritonitis. It is proper to state that in both cases the operation was done for the removal of a supposed ovarian cyst, and that a correct diagnosis was made in the first case during the operation, after the pedicle was traced to the pancreas, and the intact portions of the gland were indentified. In the second case the post-mortem examination revealed the true nature and location of the cyst.

The brilliant result obtained by Dr. Bozeman is well calculated to stimulate others to follow his example. Extirpation of the cyst would guard most effectually against the formation of a permanent pancreatic fistula; but, on account of the deep location of the pancreas, shortness or absence of a pedicle, and the many obstacles thrown in the way of the operator by adjacent organs, the procedure becomes one surrounded by innumerable difficulties, and in the present state of our science, of doubtful propriety. Simple evacuation of the cyst contents by means of an aspirator offers two principal objections against its adoption in the treatment of cysts of the pancreas. 1. Escape of cyst-contents into the peritoneal cavity. 2. Reaccumulation of secretion.

Reasoning from analogy, we should naturally expect that when pancreatic juice is brought in contact with the peritoneum it would produce a destructive effect upon it by its digestive properties, or it might be even followed by diffuse peritonitis. In opposition to this assumption, it is affirmed that in experiments on the pancreas, it happens quite frequently that pancreatic juice escapes into the abdominal cavity from the canula introduced into the pancreatic duct without any bad results on the animal. Concerning this point, Heidenhain (*Archiv f. d. Gesammte Physiologie*, vol. xiv. p. 466) says: "The animals do not suffer from this circumstance, as the duct is regenerated in spite of the wounded surface being bathed in the secretion. Nevertheless it is difficult to explain this. Why do not the wounded and suppurating tissues undergo digestion by the pancreatic juice? The efficacy of the albumen ferment is destroyed in some way I presume, probably by being changed into zymogen, the living tissues having the same effect on the juice, as Podolinski observed, by treating the pancreatic juice with pulverized zinc or yeast ferment." . . . Although small quantities of pancreatic juice may escape into the peritoneal cavity of an animal without any serious consequences, we have no evidence to show that the peritoneal cavity in man is possessed of the same immunity against such accident; and it would not be prudent to expose a patient to such risk without more light is thrown on this subject by further observation and experiment. At the same time we must not forget that pure pancreatic juice is only found in small cysts, as the contents of large cysts have undergone various transformations, and are mixed with different accidental products, which might prove an additional source of danger in producing peritonitis. In all of the cysts where a pancreatic fistula was established, the artificial opening continued to discharge the secretion for a variable period of time, and in two cases the discharge had not ceased at the time the report was made, and hence reaccumulation would have been inevitable in case the fluid had been removed by aspiration.

For these reasons the treatment by aspiration should be limited to cysts of moderate size, and where adhesions have formed between the cyst and the anterior walls of the abdomen. In cases presenting these favorable conditions, aspiration deserves a trial, and may be repeated as often as required, or until symptoms arise which call for more radical measures. The needle should always be thoroughly disinfected by passing it through the flame of a spirit-lamp and by dipping it in a five per cent. solution of carbolic acid. The puncture is made obliquely so as to prevent the formation of a fistulous opening. The fluid should be withdrawn slowly, and the cyst emptied as completely as possible. After the operation, gentle pressure should be made over the cyst by applying a compress and elastic bandage.

The safest, and at the same time, the most efficient treatment, consists in establishing a pancreatic fistula. The operation which accomplishes this purpose most safely and in the shortest time, consists in exposing the cyst by an incision, stitching its walls to the margins of the wound. The same aseptic precautions must be observed before, during, and after the operation, as in any other abdominal operation. The stomach being generally pushed forward and toward the right by the cyst, it is advisable to empty this organ completely as a preliminary measure by abstinence of food and the use of the siphon irrigator. Except in my case, the incision was always made in the linea alba.

It seems to me that the incision should always be made over the most prominent part of the tumor, and as near as possible over the seat of obstruction. In following this rule we select the place where we are most likely to find adhesions, at the same time we establish the straightest and most direct route to the primary origin of the cyst. An incision through the linea alba, or parallel with the costal arch, will afford the easiest access, with a minimum risk of injury to important parts. The external incision should be at least four inches in length, while the peritoneum should only be opened to the extent of two inches for the purpose of making an exploratory examination, to be enlarged as occasion may require. If adhesions be found between the cyst and the omentum, and the omentum and the parietal peritoneum, the cyst is punctured with an exploratory needle, and, if the diagnosis be corroborated, the operation is finished by incising and draining the cyst. If no adhesions be found between the omentum and peritoneum, the former is incised so as to expose the cyst-wall, when either of the following plans may be pursued: The parietal peritoneum is stitched to the skin with catgut. The margins of the omental wound are pushed back under the abdominal walls so as to expose the cyst freely when the wound is packed from the bottom with iodoform gauze, and an antiseptic dressing is applied and retained for six or eight days, or until adhesions have formed between the cyst and the margins of the wound, which have effectually shut off the peritoneal cavity, when the cyst is incised and drained. Suturing of the cyst-wall to the margins of the wound as a preliminary operation should never be resorted to, as, on account of the thinness of the cyst-walls, there is danger of escape of fluid into the peritoneal cavity from the punctures made by the needle, an occurrence which the procedure was intended to obviate. With proper care, however, the operation can be completed at once.

The cyst-wall is grasped with two many-toothed forceps and drawn forward so as to bring it in accurate and close contact with the margins of the wound, when the fluid is removed with an aspirator or trocar with the same care as in emptying an ovarian cyst. As the cyst becomes empty it is pulled through the wound, which obviates any further danger of escape of fluid into the peritoneal cavity. When the cyst is nearly empty it is freely incised and sutured to the peritoneal lining of the abdominal wound. The drainage tube should be fully three-fourths of an inch in diameter, and must reach from the bottom of the cyst to the surface of the wound. After emptying the cyst completely by compression, and placing the patient on his side, a large Lister dressing is applied for the purpose of guarding against infection, and to absorb the secretions. Frequent change of dressing may be required on account of copious escape of pancreatic secretion. Past experience would dictate the advisability of protecting the skin against the digestive action of the pancreatic juice by applying carbolized oil freely. The antiseptic dressings should not be abandoned until the peritoneal cavity has become completely closed by firm adhesions, and the size of the cyst has been reduced to a fistulous tract. The drainage tube is shortened from time to time as the depth of the fistulous opening is diminished by obliteration of the cyst from the bottom of the tract.

The speedy obliteration of the cyst will depend on the continuance, abatement, or removal of the obstructing cause, or the condition of the gland tissue distal to the seat of obstruction. If the stricture in the common duct of the pancreas be complete and of a permanent character, the obstruction will continue, and if healthy gland tissue remain on the distal side the fistula will continue to discharge pancreatic juice. If the inflammation which caused the obliteration of the duct subside and the passage again become permeable, the natural outlet will be again established and the artificial duct will become obliterated. If an impacted calculus has caused the retention and the fistula continues to discharge, a careful examination should be made to detect the calculus, and, if found, an effort should be made to remove it through the fistulous opening. If the obstruction has become permanent and the gland tissue on the distal side has been destroyed either by the cause or causes which produced the obstruction, or by the intra-cystic pressure, that portion of the organ has been deprived of its functional capacity, and as no pancreatic juice is secreted, definitive obliteration of the cyst and permanent closure of the fistulous tract will take place in a comparatively short time.

In recapitulation, I believe I am justified in submitting the following conclusions:—

1. Cysts of the pancreas are true retention cysts.
2. Cicatricial contraction or obliteration of the common duct or its branches, and impacted calculi are the most frequent causes of cysts of the pancreas.
3. A positive diagnosis of a cyst of the pancreas is impossible, a probable diagnosis between it and some other kind of cysts amenable to the same surgical treatment is adequate for all practical purposes.
4. The formation of a pancreatic fistula under antiseptic precautions recommends itself as the safest and most expedient operation in the treatment of cysts of the pancreas.

ARTICLE II.

THE INFLUENCE OF COCAINE, ATROPINE, AND CAFFEINE ON THE HEART AND BLOODVESSELS.

By H. G. BEYER, M.D., M.R.C.S., Passed Assistant Surgeon U. S. N., Honorary Curator, Section Mat. Medica, U. S. National Museum.

THERE are few known drugs that have, within such a short space of time, risen from comparative obscurity to such practical as well as theoretical importance as cocaine. Its great value as a local anæsthetic, and its wide application in all the branches of medicine and surgery, together with our comparative ignorance in regard to many points of its action on the animal organism, is perhaps quite sufficient argument in favor of any attempt calculated to throw more light on the subject.

The fact that cocaine, applied to mucous surfaces, will produce temporary localized anæsthesia being now firmly established and generally accepted, and, it being furthermore well recognized that it also produces dilatation of the pupil, the important question now arises how all this is done, and what is the mechanism of the production of these two conditions. This is a problem which is as yet far from being solved.

When we reflect that the experimental evidence, which so far has been adduced in explanation of the phenomenon of pupillary dilatation produced by atropine and that of pupillary contraction by opium, two such long and well-known drugs, is as yet far from being considered as generally satisfactory, we may perhaps be much better able to realize also the difficulty which must necessarily be in the way of solving a similar problem with regard to cocaine. It may require the work of many intelligent physiologists for several years to come in order to bring the problem to a final solution which will prove satisfactory to all.

A priori, the anæsthesia produced by cocaine might be due to its directly paralyzing influence on the terminal filaments of sensory nerves and nerves of special sense, the production of anæsthesia being also accompanied by a temporary abolition of special sense, at least as far as the mouth, ear, and nose are concerned. By many, no doubt, it has been supposed that a stimulating influence on the sympathetic is the cause underlying both the production of anæsthesia as well as that of pupillary dilatation, and, indeed, the probability in favor of such action is very great, and would explain everything very satisfactorily if experiment would prove it. By still others, the anæsthesia has been thought to be probably due to a temporary contraction of the capillaries, in consequence of which the tissues are, for the time being, deprived of their normal blood supply and thus rendered insensible to external impressions. The latter view has been advanced by Dr. Edward R. Squibb, in his *Ephemeris*, January and March, 1885, and has a great deal in its favor. A certain amount of blanching of those mucous surfaces to which cocaine has been applied is almost invariably present by the time anæsthesia has become established. A slight amount of capillary contraction may also be seen by any one in the expanded frog's web after the direct application or hypodermic injection of cocaine, more marked when the capillaries had previously been irritated and an artificial dilatation thus been produced.

It was with a view of throwing, if possible, some additional light on the influence of cocaine on the circulatory apparatus that the following observations were undertaken. Soon after beginning my experiments with cocaine on the heart of the terrapin I was very much impressed with the great similarity of the effect produced by cocaine and atropine. The action of the latter drug had formed the subject of some of my previous experiments, but, on account of the supposed peculiarity of some of them, they were not all published at the time.

This striking similarity made me subject atropine to renewed and more extended investigation with results to be referred to hereafter more in detail.

Caffeine was also afterwards taken up in addition to these because of the supposed similar action.

All the experiments here described were made in the laboratory of the Museum of Hygiene under the auspices of the Bureau of Medicine and Surgery, Navy Department, Washington, D. C. My thanks are, therefore, due to the chief of that bureau, Surgeon-General Francis M. Gunnell, and also to Medical Director John M. Browne and Surgeon C. H. White, for much kindness in facilitating my work.

The experiments fall into two groups—

I. Experiments on the work done by the heart when isolated from the central nervous system.

II. Experiments on the flow through the bloodvessels of animals whose brains and spinal cords had been destroyed.

METHODS OF INVESTIGATION EMPLOYED.

I. ON THE HEART.—This method as here used, was, I think, originally suggested by Prof. H. Newell Martin, and has since been employed in the laboratory of the Johns Hopkins University at Baltimore, by several of the advanced students in physiology, and become variously modified and perfected until now it forms one of the best and readiest means for studying the action of drugs on the heart of cold-blooded animals. The operation is nearly the same for both frogs and terrapins. If a terrapin is used it is weighed, its head cut off, and the spinal cord destroyed; the plastron is then removed, the pericardium opened, and canulas introduced into two or three of the great venous trunks leading to the sinus, designated as "inflow canulas," and usually two canulas into the arterial stems leading from the ventricle, designated as "outflow canulas," the remainder of the vessels directly connected with the heart are ligatured and the entire organ thus prepared is left *in situ.* I should like, here, to put stress on the necessity of placing at least two inflow as well as two outflow canulas into the afferent and efferent vessels of the heart respectively, for, unless this precaution is taken, the condition of the heart cannot be called entirely normal, as will be readily seen from a glance at the anatomy of that organ in the terrapin; only a portion of the heart would really be kept in circulation with only one arterial and one venous canula. The operation being finished, the animal is placed in a box especially made for the purpose. The box is of wood, with a suitable support inside of it, against which the back of the terrapin can rest securely, and is covered with a glass cover, which can be removed. The creature is thus protected from any injurious outside influences, such as draughts, etc.

The nutrient fluids are supplied to the heart from a system of Mariotte's flasks, each holding about 1000 c.c., and by means of rubber tubes and Y-shaped glass tubes, so connected that the flow from each passes through a common outlet. This outlet tube is in the same way connected with the two or three inflow or venous canulas leading into the sinus.[1] When different liquids are used, they were contained in separate Mariotte's flasks, carefully adjusted, so that the pressure under which the liquid flowed out of them was the same for all. The supply tubes of these flasks had stopcocks on them, by the closing and opening of which any one flask could at will be used to feed the heart. All the Mariotte's flasks stood on the same horizontal platform, and were raised and lowered equally by moving this support, if it became desirable to change the venous pressure in the course of an experiment.

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[1] In all the experiments on the heart described in this paper the venous pressure indicates the height above the heart of the bottom of the air-tube of the supplying Mariotte's flasks. For example, "venous pressure 4 cm." indicates that the liquid supplied to the heart enters the canulas supplying that organ under a pressure exerted by a column of the nutrient liquid four centimetres in height, and so on.

The outflow canulas coming from the aortæ, or, in some cases, also from the pulmonary artery, were all connected with a single tube, from the distal end of which liquid, pumped around by the ventricle, flowed out and was collected and measured at certain intervals. The height of the orifice of this tube above the heart is referred to in each experiment as the "arterial pressure." Being kept constant throughout an experiment any variation in the weight of blood pumped out in a unit of time was proportional to the variation in the work done; that is to say, the "lift" remaining the same, any change in the work was indicated by and directly proportional to variation in the "load" lifted.

As the specific gravity of the various liquids used in any one experiment differed but slightly, the load lifted was practically proportional to the bulk of the liquid pumped out by the ventricle. Accordingly it is stated in the third column of each of the tables of experiments in cubic centimetres. The temperature stated in the fourth column is that of the liquid supplied to the heart. It never differed more than 0.5° C. from the temperature of the box in which the terrapin was inclosed, and gives more accurately the temperature of the heart. A mercury manometer was connected with the outflow-tube near the heart, its pen writing on the smoked paper of a revolving drum, on which also a chronograph recorded seconds.

Most of the experiments were made during the months of March, April, and May, a few also during the winter. From the experience gained by experimenting on animals of variable and usually low temperatures, I have learned that the season of the year exercises a much greater influence on the results attained than is generally believed to be the case. For instance, the inherent resistance of a terrapin's heart to the influence of drugs increases in direct proportion to the advancing season from winter to spring. It was found that the same dose which produced diastolic cardiac arrest in a terrapin's heart during the winter was only just sufficient to produce the characteristic stimulatory effect during the spring. This diminished resistance to the influence of drugs seems to be moreover independent of the temperature of the nutrient blood mixture used at the time, and also to a certain extent of the size and weight of the animal itself.

The same may be said as being true also of the amount of work done, which is much greater during the spring and summer months than it is during the winter, independent of the fact that the rate be made the same in both seasons. The rate of beat of the heart, on the contrary, is directly dependent on the temperature of the circulating fluid, and may, in a terrapin's heart, even during the winter months, according to the temperature of the circulating fluid, be increased from 5 or 6 to 40 or 50 beats a minute as quickly as the supplying flasks can be made to feed the heart with the different nutrient fluids.

II. ON THE FLOW THROUGH THE BLOODVESSELS.—The method employed in the second group of these experiments was devised in the Biological Laboratory of the Johns Hopkins University about three years ago by Donaldson and Stevens (*Journal of Phys.*, vol. iv. p. 165), and is well adapted for determining the action of substances upon the bloodvessels of cold blooded animals as is shown in their study of digitaline. This method, at that time, consisted in cutting out the heart and inserting canulas into the aortic trunks and the venæ cavæ. The aortic canulas were connected with the Mariotte's flasks, placed at a certain height above the body of the animal from which flasks liquid was made to flow into the arteries. This liquid, after circulating through the capillaries and veins, was drained off from the venæ cavæ and measured at definite intervals. After this venous outflow had become constant, circulating fluid mixed with the drug was substituted for normal circulating fluid and the action of the drug on the bloodvessels determined from the change which took place in the amount of the outflow in a unit of time. A decreased outflow indicating increased resistance to the flow of the fluid through the vessels, in other words, a constriction of them, and an increased outflow a dilatation of them.

The circulating fluid used was a 75 per cent. salt solution, because it was found that defibrinated blood, which first suggested itself, appeared to clog the capillaries.

Last year Mr. Stevens, in conjunction with Mr. Lee, considerably improved the method by replacing the heart of the animal by an instrument which, like the heart, forced intermittingly into the arteries, at a constant and uniform rate, equal amounts of the circulating fluid. A full description of this instrument will be found in *Studies from the Biological Laboratory of the Johns Hopkins University*, vol. iii. No. 2, page 101. For the sake of comparison, both constant and interrupted pressures were used in my experiments, and the results proved in the main identical. Regarding the operation on the animal, since it was desirable for my purposes to exclude the central nervous system and to determine the direct action of the various drugs on the bloodvessels themselves, the brain and spinal cord were destroyed and the abdominal viscera and hind-legs alone kept in circulation.

The authors of the method, in the course of their investigation, have, I think, sufficiently proven that the circulation with salt solution can be kept up for at least two hours without producing any very great changes in the pressure or in the elasticity of the bloodvessels, and also without seriously affecting their contractility. As circulating fluid I have given the preference to Ringer's Saline, the composition of which is as follows:—.

Normal salt solution (0.75 per cent.)	100	c.c.
Calcium chloride sol. (1 : 390)	5	c.c.
Sod. bicarbonate sol. (0.50 per cent.)	2.5	c.c.
Pot. chloride sol. (1.0 per cent.)	0.75	c.c.—Mix.

This mixture was first proposed by Sydney Ringer (*Journal of Physiology*, vol. iii. p. 39), as a substitute for the normal salt solution, and answers excellently well.

COCAINE, ATROPINE, and CAFFEINE.

I. Experiments on the heart.
II. Experiments on the bloodvessels.

A. COCAINE.

In reviewing the literature, only so much of it will here be considered as has a direct bearing on the subject in question. A few points in connection with the history and evolution of *erythroxylon coca*, Lam., and its alkaloid *cocaine*, may, perhaps, prove of some interest.

In 1565, Nicolas Monardes published at Seville a History of Medicinal Plants brought from the New World, in which, among others, he gave a description of coca leaves, their mode of collection and drying, stating that they formed the most important article of commerce, being used for barter or exchange of money among the South American Indians. The use which the latter are said to have made of it was manifold. First, they chewed the leaves mixed with powdered calcined oyster shells, the paste, after being allowed to ferment, was made into boluses or troches and dried; during long journeys these boluses were sucked, and under their influence hunger and thirst were alleviated and bodily strength sustained. Second, when eaten for the purpose of producing pleasure and intoxication, the coca was chewed by itself. Third, it was mixed with tobacco and smoked.

Coca being also used by the Incas in their religious rites, where it was treated with great reverence, a council of bishops, that met in 1659, condemned its use, stating, that the belief entertained by the Indians that the habit of chewing coca gave them strength was an illusion of the devil. Dr. Weddell (*Journal of Pharmacy*, 1854), a traveller noticed that it did sometimes produce evil consequences, and that, in some instances, a peculiar aberration of mind occurred, indicated by hallucinations. In the year 1750, Joseph de Jussieu sent the first botanical specimen to his brother Antoine Laurent de Jussieu, who referred it to the genus *Erythroxylon*, and subsequently Lamarck designated it as *Erythroxylon coca*. The alkaloid was first produced by Garnecke in 1855, and by him called *Erythroxyline.* Two years later, S. R. Percy presented to the Academy of Medicine of New York a small quantity of the alkaloid, and at the same time called attention to the fact that it possessed the property of paralyzing, temporarily at least, the sensibility of the tongue. An account of this may be found in the *Proceedings of the Academy of Med. of New York*, November 4th, and December 2d, 1857 In 1859 Niemann produced and called the alkaloid *cocaine*, and Lossen extracted another principle from it which he called *hygrine.* This author states that cocaine augments arterial pressure when used in small doses, but that when used in larger doses it paralyzes the sensory nerves and the posterior columns of the cord. In 1860 Dr. Mantegazza, of Milan, then a practising physician in South America, wrote on the dietetic and medicinal properties of *Erythroxylon coca* (*Journal of Pharmacy*, I. i. 1860, pp. 606, 618), in which article he gave a detailed account of its marvellous properties. In experimenting with it on himself, he found that coca increased the heart's action. In 1862 Schroff (*Zeitschrift f. Wiener Aerzte*, Nos. 30–34), first experimented with it on man, and found that in large doses it caused vertigo, slight deafness with disturbances of memory and coördination of thought. A year later, Fronmüller (*Prager Vierteljahrschrift*, 1863) reported fourteen cases in which sleep had been produced by the administration of about five grains of cocaine, and Ploss, during the same year, reported that after taking about 20 grains of cocaine, he fell into a tranquil sleep, and upon awaking, experienced pain in the abdomen with dryness of the mouth, vomiting, vertigo, and anuria, lasting for twenty-four hours; intelligence remained normal. Moreno (Recherches sur l'Erythroxylon Coca, *Thèse de Paris*, 1870), then proved by experiment, that local injections of cocaine abolished reflex movements. Alexander Bennett (*British Med. Journal*, April 18, 1874), after experimenting on over one hundred animals, concluded as follows: (1) In small doses cocaine causes cerebral excitement and partial paralysis of sensibility. (2) In somewhat larger doses, cerebral excitement, complete paralysis of sensibility, tetanic spasms and death. (3) Paralysis of the entire posterior columns of the cord, and also of the entire system of the peripheral sensory nerves, but the anterior columns of the cord and the peripheral motor nerves were not paralyzed. Sir Robert Christison, experimenting upon himself, mainly confirmed the results attained by others in regard to the strength sustaining properties of coca. Dr. Isaac Ott (*Med. Record*, 1876), after chewing 60 grammes of the leaves during nine hours, discovered dilatation of the pupil, frontal headache, drowsiness, increase in the pulse and temperature, and a decrease in the amount of chloride of sodium excreted by the kidneys. From experiments on lower animals, he found among others, that it did not possess the property of paralyzing the pneumogastrics. In 1880, Von Aurep (*Pflueger's Archiv*, Bd. 21) found that sensibility of the skin was abolished by hypodermic injections of cocaine, and that the tongue became numb when touched with strong solutions, and he also noticed that the pupils became dilated when the solution was applied to the conjunctiva. Tauvel (*L'Union Médicale*, 1877) also was one of the first who used cocaine for its beneficial effects on the larynx and pharynx, and Aschenbrandt must (*Deutsche Med. Wochenshrift*, 1883, No. 50) be mentioned as regarding cocaine as a stimulant and a retarder of destructive tissue metamorphosis. Rossbach (*Handbuch d. Arzneimittellehre*, by Nothnagel and Rossbach, p. 625, 4th edition, 1880) makes the prophetic remark, that cocaine producing localized anæsthesia further researches on the subject might prove of advantage. Yelinek (*Wiener Med. Wochenshrift*, 1884, Nos. 45 and 46), was one of the first to direct attention to the anæsthetic effect produced by cocaine on the larynx and pharynx and to make practical use of this discovery.

But the priority in this new era in the literature of cocaine, from a careful review of all passed and present writings on the subject, belongs undoubtedly to young Dr. Koller.

Since the reading of Dr. Koller's paper before the last ophthalmological congress at Heidelberg, a large number of experiments have been made with cocaine mainly with regard to the anæsthetic effects which it produces on most any mucous surface with which it may be brought in contact. The literature is of rather recent date, and no doubt still fresh in the minds of many, so that most of it may here be omitted. There are, however, a few facts which, on account of their having a practical bearing on the subject here treated of, I must cite. Thus, Paul Bert, in a communication to the Biological Society of Paris, on the 17th of January, 1885, made the following observation: He injected into a blister, produced by a Spanish fly-plaster, a small quantity of the alkaloid cocaine and thus attained loss of sensibility of the denuded surface. He then covered the denuded surface of another similarly produced blister with perforated lint soaked in a solution of cocaine, and found after a while that those points of the denuded surface which had remained uncovered by the lint retained their normal sensibility, while the covered portions had lost it, evidently a proof of the fact that its action is a mere local one. On the other hand, we have the statement of Dr. Brown-Séquard (*Société de Biol.*, March 14, 1885) that, on the contrary, cocaine does not act merely locally in producing anæsthesia, but that it also produces inhibition at a distance. This view of Brown-Séquard, it would seem, receives also a certain amount of support from the experiments made by Drs. Hall and Halsted. One of these gentlemen gave Mr. Locke, a medical student, an injection of 9 minims of a 4 per cent. solution of cocaine into the substance of the inferior dental nerve at the point where it enters the inferior dental canal. The result was, that in from four to six minutes there was complete anæsthesia of the tongue on the side where the injection was made, extending to the median line and backward to the base as far as could be reached with a pointed instrument. There was complete anæsthesia of the gums anteriorly and posteriorly, and all the teeth on that side were insensible to blows. The soft palate and uvula of the same side were *anæmic* and insensible. Although it might perhaps be possible to produce loss of sensibility by the merely local action of cocaine on a large nerve-trunk all over the area of distribution of its fibres, the anæmia of the palate and tonsil could scarcely be explained in this way, as produced by Drs. Hall and Halsted. Therefore, it is not unlikely but rather probable, as will also be seen from these experiments later on, that cocaine inhibits at a distance.

So far as the influence of cocaine on the circulation is concerned, we have the further statement of Dr. Wm. Oliver Moore that it increases the frequency of the pulse (*N. Y. Med. Journal*, Jan. 3, 1885), and of Dr. Hermann Biggs (*Journ. Am. Med. Assoc.*, Jan. 17, 1885) that it has a depressant action on the heart, reducing the force and frequency of its pulsation and finally paralyzing it (both auricles and ventricles) in diastole. Biggs furthermore concludes from his experiments on the frog that cocaine kills by paralysis of respiration, and that it also paralyzes the pneumogastrics, which are said by Ott not to be paralyzed by cocaine.

Dujardin Beaumetz has made the observation that in several cases in which cocaine was used hypodermically, syncope of brief duration ensued. He attributes the occurrence to cerebral anæmia, and states that it never occurred while the patient was kept in the prone position, and this is another instance against the view of cocaine acting merely locally.

Finally another series of interesting experiments which requires some notice in this connection are those made by Dr. Erroyd, who, after hypodermic injections of cocaine found that the pulse may become either accelerated or slowed, but always becomes stronger and fuller than normal.

Much valuable information may be found in Squibb's *Ephemeris* for 1885, and also in the compilation of the literature on cocaine made and published by Parke, Davis & Co., of Detroit and New York, 1885.

1. *Influence of Cocaine on the Heart.*

Experiment XXIV. has been selected from a large number as a typical one illustrating at a glance: First the initial stimulating or exciting influence of cocaine on the heart's action by slightly increasing its normal rhythm and the work done per minute. In the second place, it shows the peculiar but typical inhibitory influence which it exercises over the ventricular rhythm while that of the auricles continues unchanged. That this reduced ventricular rhythm is not a state of paralysis but merely one of inhibition may well be inferred from the amount of work the ventricle is still performing, being in some instances much greater even than under normal conditions. This point is still better seen when (at 4.55 P. M.) the venous pressure was raised to 14 cm., the ventricle still beating at the rate of 13 per minute, the auricles at 26, with the result of increasing both its rate as well as the work done, just what takes place under normal conditions when the venous pressure is raised and the heart happens to be powerful enough to propel the extra amount of blood thus forced into it. I see, therefore, nothing in the way so far of interpreting these phenomena, as due to the stimulating influence of cocaine on the heart's action. Larger doses of cocaine, however, than were used in this experiment or cocainized blood of the same strength as used here, longer continued will finally produce standstill in diastole of both auricles and ventricle. But even after this diastolic arrest is complete, and both auricles and ventricle over-distended with blood which they are unable to propel, it is in most cases possible to cause the heart to recover perfectly in a comparative short space of time, as many of my experiments show and make it continue to beat as often and do as much work as before. During the winter months, however, this stimulatory effect is less pronounced, and therefore much easier overlooked.

From these experiments it is concluded : (1) That cocaine is exceedingly prompt and uniform in its effects upon the heart. (2) In small doses it is a powerful stimulant to the heart's action. (3) In medium doses it has an inhibitory influence over the ventricular contractions, and (4) in large doses it produces diastolic arrest from which, however, the heart may be recovered under suitable condition.

Experiment XXIV.—April 18, 1885. Terrapin 1350 grms. Calf's blood and Ringer's saline (1 : 1½). Inflow canulas in inferior and left superior venæ cavæ. Outflow canulas in pulmonary artery and right aorta. Venous pressure 4 cm. Arterial pressure 25 cm. Cocoainized blood contained 0.004 grm. of the bromide of cocaine : 100 c.c. of the normal nutrient blood mixture.

Time. P.M.	Rate p. min.		Work in c. c. p. min.	Temp. Cent.	The circulating fluids were supplied to the heart at the time mentioned on the same line in first column.
	Aur.	Ventr.			
3.20	22	22	38	24°	
40	22	22	38		
45	22	22	39		
50	22	22	38		
55	22	22	39	...	On cocainized blood for ½ minute.
4.00	22	22	38		
05	22	22	42	24	
11	23	23	54	...	On cocainized blood for one minute.
14	23	23	48		
17	23	23	49	...	On cocainized blood for one minute.
20	24	12	43	...	Ventricular rhythm became reduced to one-half normal 2 minutes after cocainized blood had been turned on the last time.
24	24	12	44		
27	24	12	42	23.5	
30	26	26	55		
33	26	26	55	...	On cocainized blood for 1½ minute.
35	26	26	48	...	Ventricular rhythm was reduced at 4.36.
38	24	12	55		
41	24	12	56		
43	26	26	47	23.5	At beginning of this obs. normal rhythm returned.
45	26	26	47	...	On cocainized blood for two minutes.
47	...	...	...	...	Two auricular to 1 ventricular contraction.
51	26	13	48		

Time. P.M.	Rate p. min. Aur.	Ventr.	Work in c. c. p. min.	Temp. Cent.	The circulating fluids were supplied to the heart at the time mentioned on the same line in first column.
55	26	13	46	...	Venous pressure raised to fourteen cm.
58	26	26	74		
5.00	28	28	84	23.5°	Venous pressure lowered to four cm.
06	26	26	60		
13	26	26	55	...	On cocainized blood for three minutes.
19	26	13	50	...	Ventricular rhythm became reduced before cocainized blood was withdrawn.
22	26	13	47		
29	26	13	45		
32	26	13	55	23	
35	26	13	58		
39	26	13	60		
45	26	13	59		
50	26	13	59		
55	26	13	58		
6.00	26	26	60	23	Experiment discontinued.

2. *Influence of Cocaine on the Bloodvessels.*

Experiment XIV.—April 7, 1885. Terrapin 1470 grms. Ringer's saline. Venous pressure 0. Arterial pressure 23 cm. Inflow canulas placed into the two aortic trunks. The other arteries are tied. Outflow canula in sinus. Brain and cord destroyed. Constant pressure.

Time P. M. From	to	Temp. Cent.	Total outflaw.	Outflow p. min.	The circulating fluids were supplied to the vessels at the time mentioned on the same line in second column.
3.30	...	...	...	...	Terrapin in box.
41	3.43	18°	90	45	
43	45	...	94	47	
45	47	...	96	48	On cocainized saline containing 0.002 : 100 c.c. 1 minute.
47	49	...	85	42.5	
49	51	...	68	34	
51	53	...	70	35	
53	55	...	74	37	
55	57	18	93	46.5	
57	59	...	92	46	On cocainized saline, as before, one minute.
59	4.01	...	88	44	
4.01	03	...	88	44	
03	05	...	102	51	On cocainized saline one minute.
05	07	...	95	47.5	
07	09	...	80	40	
09	11	18	104	52	
11	13	...	100	50	On cocainized saline two minutes.
13	15	...	90	45	
15	17	...	70	35	
17	19	...	90	45	
19	21	...	92	46	
21	23	...	92	46	On cocainized saline four minutes.
23	25	18	85	42.5	
25	27	...	64	32	
27	29	...	80	40	
29	31	...	82	41	
31	33	...	80	40	On cocainized saline containing 0.004 : 100 c.c. four minutes.
33	35	...	72	36	
35	37	...	45	22.5	
37	39	18	57	28.5	
39	41	...	60	30	
41	44	...	76	25.3	
44	47	...	90	30	
47	50	...	80	26.6	
50	52	...	52	26	
52	54	...	50	25	On cocainized saline, as above, six minutes.
54	56	18	40	20	

Time P. M.		Temp. Cent.	Total outflow	Outflow p. min.	The circulating fluids were supplied to the vessels at the time mentioned on the same line in second column.
From.	to.				
56	58	...	40	20	
58	5.00	...	40	20	
5.00	02	...	35	17.5	
02	04	...	34	17	
04	06	...	32	16	
06	09	...	30	10	
09	12	18°	30	10	
12	15	...	25	8.3	
15	20	...	44	8.8	
20	25	...	41	8.1	
25	30	...	38	7.6	
30	35	...	40	8	
35	40	18	40	8	Raised arterial pressure to thirty cm.
30	45	...	73	14	
45	50	...	85	17	
50	55	...	90	18	
55	6.00	...	90	18	Experiment ended.

Experiment XXIII.—April 17, 1885. Terrapin 2350 grms. Ringer's saline. Venous pressure 3 cm. Arterial pressure 20 cm. Inflow canulas in right and left aortic trunks. Outflow canula in sinus; rest of vessels tied except right subclavian, which is reserved for a pressure canula to be connected with mercury manometer. Brain and cord destroyed. Interrupted pressure. Cocainized saline contains 0.1 : 50 c.c.

Time P. M.		Temp. Cent.	Total outflow.	Outflow p. min.	The circulating fluids were supplied to the vessels at the time mentioned on the same line in second column.
From	to				
4.00	. .	...	...	...	Terrapin in box.
10	4.12	15.5°	46	23	
12	14	...	50	25	
14	16	...	50	25	
16	18	...	53	26.5	
18	20	...	53	26.5	
20	22	...	52	26	
22	25	...	75	25	Injected twenty minims of solution of coc.
25	27	15.5	40	20	
27	29	...	50	25	
29	31	...	54	27	Injected twenty minims of coc. saline.
31	33	...	44	22	
33	35	...	48	24	
35	37	...	52	26	Injected twenty minims of coc. saline.
37	39	15.5	50	25	
39	41	...	44	22	
41	43	...	42	21	
43	45	...	36	18	
45	47	...	35	17.5	
47	49	...	32.5	17.5	
49	51	...	40	20	
51	54	16	51	17	
54	57	...	64	21.3	
57	59	...	43	21.5	
59	5.01	...	48	24	
5.01	03	...	54	27	Injected twenty minims of coc. saline.
03	05	...	37	18.5	
05	07	...	32	16	
07	09	16	26	13	
09	11	...	30	15	
11	14	...	51	17	
14	16	...	51	25.5	Injected twenty minims of coc. saline.
16	18	...	44	22	
18	20	...	40	20	
20	22	...	48	24	Injected forty minims of coc. saline.
22	24	...	30	15	
24	26	...	25	12.5	
26	28	...	22	11	

This experiment was continued one hour and thirty minutes longer, with the same results.

The preceding two experiments with cocaine on the bloodvessels of the slider-terrapin show a decrease in the amount of outflow due to the action of this drug. A constriction of the vessels must be assumed to be the cause of this decreased outflow, for the following reasons: 1. In Experiment XIV., in which constant pressure was used, the outflow invariably decreased in amount on the admission into the bloodvessels of cocainized saline, but increased again in the proportion that cocaine was washed out by the normal saline until it reached its normal standard. The pressure remaining at the same level throughout the experiment, the calibre of the bloodvessels formed the only variable factor, and, therefore, the conclusion that cocaine produces a constriction of the bloodvessels is obvious. 2. In Experiment XXIII., in which interrupted pressure was used, not only the pressure, but also the amount of fluid forced into the arteries by the "artificial heart" in a unit of time remained constant, and here again, the calibre of the vessels being the only variable factor, any decrease in the outflow must necessarily be due to a diminution of the lumen of the bloodvessels. Cocaine, therefore, in small or large doses produces contraction of the bloodvessels, independent of the central nervous system.

These experiments, together with those on the heart, admit of the further conclusion, namely: A rise in the blood-pressure, consequent upon the administration of cocaine is due to a direct action of the drug on the heart and bloodvessels, stimulating the former and constricting the latter; a fall in blood-pressure coming on after the rise must be accounted for by the action of cocaine on the heart alone, since its constricting influence on the bloodvessels outlasts the stimulating influence it exerts over the ventricle of the heart.

B. ATROPINE.

The literature of the action of atropine on the circulation having already been considered in a recent paper (see *Studies from Biol. Lab. Johns Hopkins Univ.*, vol. iii. No. 2, Dec. 1884, p. 85), reference need now only be made here to a few treatises of more especial interest in connection with the present one. Von Bezold and Bloebaum (*Unters a. d. Phys. Lab. zu Wurzburg*, Heft i.) found, as the result of the smallest doses of atropine, in rabbits as well as in dogs, an increase in the frequency of the pulse-rate and a rise in the arterial pressure. In somewhat larger doses they observed an increase in the frequency of the pulse-rate, but a fall instead of a rise in arterial pressure. Still larger doses produced a decrease of the pulse-rate, which decrease, after some minutes, was followed by an acceleration and a fall in arterial pressure; the latter, however, rose again but finally remained lower than normal. A dose of 0.1 grm. injected at once into the heart of the rabbit paralyzed it almost immediately. They agree with Rossbach and Fröhlich in believing that atropine paralyzes the terminal filaments of the vagus within the heart.

Quite recently, Mr. W. B. Ransom published some exceedingly interesting observations on the heart of the octopus. Ransom says that the predominant effect which prevailed throughout all the experiments made with atropine on the octopus's heart was an excitation of the muscular fibre. Whether by increased rhythm or increased contraction, the ventricle invariably manifested the action of a stimulant, which much exceeded in importance the similar influence of the drug in vertebrates. But what was even more remarkable, he continues, the action of the poison on the nerves deviated still more from the ordinary paralyzing influence which it exercises on the vagus endings of the frog. If the nerves were injured at all, *they were the last to be affected*, while all through the observations the atropine seemed to pick out the muscle for its field of action. If the heart was beating, he remarks, there followed almost immediately an arrest in systole on the addition of a small quantity of the sulphate of atropine to the salt water in the canula of the ventricle, the curves far out-topping the preceding ones, and closely resembling the ideo-muscular contractions obtained by applying digitaline to the frog's heart, and which Luciani (Ransom) has described as also produced by atropine.

Von Bezold and Bloebaum, from their observations on the effect of atropine on the mammalian heart in different doses, have proved conclusively that the contractions of the ventricle may, according to the dose of atropine used, be either increased or retarded, or they may be even entirely arrested, and the heart stop beating in diastole. Ransom's observations on the molluscan heart, although perhaps differing slightly from those of the two preceding observers on the mammalian heart, in a few unessential details, are, to all appearances, practically identical in their results. For Ransom has observed that this phase of standstill in systole, which is produced by atropine (called by him "cardio-tonus"), gradually passes away, and is succeeded by a phase of standstill in diastole, or by one in which beats are resumed with less vigor (and frequency?) than before. In all cases, he adds, the heart shows a marked exhaustion produced by the long-continued contraction; and if the dose given be large, the irritability may become reduced almost to zero, so that stimulation of the quiescent heart with even the strongest interrupted currents produces no beats but only a slight contraction.

The rather large number of observations made on the terrapin's heart during the past two winters have enabled me to confirm the results of previous writers with regard to the initial exciting and final exhausting actions of atropine on the heart. I have seen the ventricle of the terrapin's heart shrink to almost one-third its normal size on the first admission into it of a certain dose of the poison, and continue in almost constant systolic contraction, the auricles at the same time being largely dilated and over-distended with blood, which they were unable to propel or force into the contracted ventricle. On the other hand, the heart of the terrapin may be almost at once made to stop beating in diastole by large doses of atropine. So far, then, as the actually observed phenomena are concerned, they may be considered identical for both vertebrates and invertebrates. All the more surprising is it, therefore, to find so wide a difference to exist in the action of atropine on the nerves of these different animals. Ransom, with regard to the viscerals in octopus finds that they are least and last affected, and all the other writers agree that the first and most marked action of atropine on the frog and turtle is to entirely cut off the influence of the nervous inhibitory mechanism.

In the succeeding experiment the stimulating influence of atropine on the heart is well demonstrated. A decided increase in the rate and in the work done can be plainly noticed as being due to the direct influence of the drug. But, besides this, it shows furthermore that atropine, like cocaine, exercises an inhibitory influence over the ventricular contractions, while the rate of the contractions of the auricles remains unaltered. This peculiar synchronism in the auricular and ventricular contractions may be kept up for many minutes at a time, and be reproduced at will many times during the course of one single experiment, after the strength of the dose of the drug required to call it forth has once been ascertained. In some instances the doses varied considerably, so far as atropine is concerned, which fact may, perhaps, be due to the quality of the drug as oftentimes as to the resistance offered by the heart; with cocaine, however, the dose, once ascertained, may always be relied upon as producing a certain effect.

How this inhibitory influence is brought about must, for the time being, remain unexplained. The present general belief is that atropine paralyzes the vagus endings contained within the vertebrate heart, and, therefore, it would seem irrational to assume, even to possibility, of such a thing as atropine having a stimulating influence on the intracardiac inhibitory ganglia coming on at a late stage of the poisoning, as was apparently the case in the heart of the octopus. Upon this assumption, however, the action of both cocaine and atropine might, nevertheless, readily be explained. The effect of these two drugs of increasing the pulse-rate, and also the amount of work done by the heart, would, then, have to be attributed in part to their stimulating influence on the muscular fibres (which is especially true for atropine, less so for cocaine), and in part also to the same influence on the accelerator or augmentor fibres of sympathetic origin; in other words, their stimulating influence on the muscular fibres and the sympathetic becomes manifest long before that on the terminal filaments of the pneumogastric.

The time when the ventricular contractions become reduced would have to be looked upon as marking the beginning of muscular exhaustion, as well as the beginning of stimulation of the filaments of the pneumogastric; the increased work which is done during the first stages of reduced ventricular rhythm would have to be considered as due to the simultaneous excitation of the augmentor fibres (Gaskell), counteracted, as far as rate is concerned, by the equally excited inhibitory ganglia of the pneumogastric. The final stage of exhaustion is the natural result consequent upon over-stimulation of both nervous and muscular structures composing the heart.

The following instance of "Dissociation of the Auricular and Ventricular Movements of the Heart," reported by Professor A. Chauveau, in the *Revue de Médecine*, may be of some interest in this connection. It was the case of a man, a patient in the service of Professor Boudet, who had a radial pulse of only twenty-one to twenty-four per minute, the auricles pulsating sixty-six times per minute. These auricular pulsations were tolerably regular, but perfectly independent of the ventricular rhythm, being sometimes presystolic, sometimes post-systolic.

Professor Chauveau adds the results of his investigations as to the pathogeny of this condition. By cutting one of the pneumogastrics in a horse, he obtained some dissociation in auricular and ventricular movements. But, by slightly stimulating with a galvanic current the left vagus, he obtained a sphygmographic tracing of dissociated rhythm which almost completely resembled that obtained from his patient. The inference was that a slight irritation of the vagus was the cause of the dissociated rhythm (*Med. Record*, April 4, 1885).

In the case of the terrapin's heart, I was able to produce dissociation in the auricular and ventricular movements by directly stimulating the auricles. During the first few seconds of stimulation, each auricular contraction was followed by a ventricular contraction. Both were much increased in frequency. Soon, however, the auricular contractions become perfectly independent of the ventricular ones, the auricles contracting as many as five times for the ventricle once. No such result was found to follow direct stimulation of the ventricle.

1. *Influence of Atropine on the Heart.*

Experiment XXV.—April 20, 1885. Terrapin 1645 grms. Calf's blood and Ringer's saline (1 : 1½). Inflow canulas in left superior vena cava and inferior vena cava. Outflow canulas in right aorta and pulmonary artery. Venous pressure 4 cm. at start. Arterial pressure 30 cm. Atropized blood of different strength, as indicated in each case.

Time.	Rate p. min.		Work in c.c.	Temp.	The circulating fluids were supplied to the heart at the time mentioned on the same line in first column.
P.M.	Aur.	Ventr.	p. min.	Cent.	
1.00	...	...	...	...	Terrapin in box.
40	27	27	36.5	20°	
45	27	27	38	...	Raised venous pressure to 5 cm.
50	27	27	50		
55	28	28	52		
2.00	28	28	52.5		
05	28	28	53		
10	28	28	54		
15	28	28	53	20	On atrop. blood (0.004 : 100 c.c.) ½ min.
16	30	30	70		
17	30	30	59		
20	30	30	55		
24	30	30	55	...	On atrop. blood (0.008 : 100 c.c.) 2 min.
27	31	31	55		
32	31	31	56		
35	31	31	56	20	On atrop. blood (0.04 : 100 c.c.).
36	31	31	52		
37	31	31	53		
38	30	15	56		
39	30	15	55		
40	30	15	52		
41	30	15	52	...	On normal nutrient blood.
43	30	15	56	20	
44	30	30	56		
50	30	30	57		
57	32	32	53	...	On atrop. blood (0.03 : 100 c.c.).
58	32	32	52		
59	31	31	50		
3.00	31	31	49		
03	30	15	?	20	Off atrop. blood; on normal blood.
05	30	15	53		
10	30	15	52		
15	31	31	53		
20	31	31	55		
25	31	31	54		
30	31	31	62	...	On atrop. blood (0.08 : 100 c.c.).
35	31	31	52	20	
36	30	15	58	...	Off atrop. blood; on normal blood.
37	30	15	60		
38	30	15	58		
39	30	15	59		
40	30	15	57	20	Discontinued experiment.

The preceding experiment includes five observations on the action of atropized blood on the heart from which it is concluded (1) that atropine in certain doses increases the rate of beat of the heart and also the amount of work done; (2) that it exercises an inhibitory influence over the contractions of the ventricle.

2. *Influence of Atropine on the Bloodvessels.*

Experiment XXII.—April 14, 1885. Terrapin 2356 grms. Ringer's saline. Inflow canulas placed in right and left aortic trunks. Outflow canula in sinus. Venous pressure 0. Arterial pressure 20 cm. Brain and cord destroyed. Constant pressure used. Atropinized saline contains 0.004 grm. of sulphate of atropia in every 100 c.c. of saline. Cocainized saline contains 0.1 of Parke, Davis & Co.'s bromide of cocaine in 50 c.c. of the saline.

Time P. M. From	to	Temp. Cent.	Total outflow.	Outflow p. min.	The circulating fluids were supplied to the vessels at the time mentioned on the same line in second column.
3.30	3.54				Terrapin in box.
54	56	23°	50	25	
56	58	...	52	26	
58	4.00	...	52	26	
4.00	02	...	52	26	
02	04	...	52	26	
04	06	...	52	26	
06	08	...	51	25.5	
08	10	23	48	24	
10	12	...	48	24	
12	14	...	46	23	
14	16	...	46	23	On atropized saline one minute.
16	18	...	30	15	
18	20	...	43	21.5	
20	22	...	48	24	
22	24	23.5	55	27.5	
24	26	...	52	26	On atropized saline one minute.
26	28	...	39	19.5	
28	30	...	38	19	
30	32	...	40	20	On atropized saline two minutes.
32	34	...	41	20.5	
34	35	...	...	21.5	
35	36	23.5	...	22	
36	38	...	48	24	
38	40	...	44	22	
40	42	...	44	22	
42	44	...	40	20	On atropized saline two minutes.
44	46	...	48	24	
46	48	...	52	26	
48	50	23.5	42	21	
50	52	...	39	19.5	On atropized saline four minutes.
52	54	...	50	25	
54	56	...	54	27	
56	58	...	60	30	Injected 20 minims of coc. saline.
58	5.00	...	45	22.5	
5.00	02	...	35	17.5	
02	04	23.5	41	20.5	
04	06	...	40	20	On atropized saline two minutes.
06	08	...	46	23	
08	10	...	71	35.5	Injected twenty minims of coc. saline.
10	12	...	50	25	
12	14	...	28.5	14.2	
14	16	...	33	16.5	
16	18	24	25	12.5	
18	20	...	23	11.5	
20	24	...	26	13	
24	26	...	25	12.5	On atropized saline six minutes.
26	28	...	36	18	
28	30	...	54	27	
30	32	...	70	35	
32	34	24	52	26	
34	36	...	40	20	
36	38	...	40	20	Injected twenty minims of coc. saline.
38	40	...	28	14	
40	43	...	25	8.3	
43	45	...	37	18.5	
45	49	...	71	17.7	
49	54	24	38	7.6	
54	59	...	65	13	
59	6.02	...	40	13.3	
6.02	04	...	38	19	
04	06	...	22	11	
06	08	...	16	8	
08	10	...	24	12	
10	12	24	35	17.5	Experiment discontinued.

Three experiments were made with atropine on the bloodvessels; from these Experiment XXII. was selected because it not only illustrates what was found in all of them, the typical action of atropine on the vessels, but it also shows, at the same time, the influence of cocaine on the vessels after atropization. From this and other experiments it may be concluded (1) that atropine first causes a contraction and afterwards a dilatation of the bloodvessels; (2) that cocaine acts on atropized vessels in the same way that it does on normal ones, *e. g.*, it causes their contraction.

Experiment XV. is intended to illustrate in a still more striking manner than the two previous ones the similarity in the action of the two drugs, cocaine and atropine, on the heart. The solution of the sulphate of atropine was injected into one of the inflow tubes leading directly into the sinus, while normal saline was running through it. After the heart had been slightly cocainized for the first time a slight increase in the rate with a diminution in the work done may be noticed; this occurs also when atropine is used in merely stimulating doses. This diminution in the work done is due to the fact that the ventricle becomes reduced in size, its systole longer, and its diastole shorter, owing to the stimulus to contraction which the heart has received from the drug. When, at 2.25 P.M., cocainized blood was turned on, and immediately afterwards fifteen minims of the solution of atropine was injected, so as to bring the heart at once under the influence of both these drugs, we find as the result that the characteristic and typical cardiac synchronism produced is much more profound than when either of the drugs was used alone. (See Figs. "*c*" and "*d*," Plate II.) In addition to the reduced ventricular rate of contraction the tracings show a very marked diastolic descent which is not seen in the tracings from those experiments in which either cocaine or atropine was used alone. The reduced rate in this instance continued for over one hour, namely, from 2.30 P.M. to 3.34 P.M., thus showing conclusively the similarly directed influence of the two drugs on the heart.

Further on in the experiment, when atropine and cocaine were used alternately, it will be seen that the effect produced is identical although not as long continued as under the influence of the combined drugs.

But while, as thus far shown, the action of the two drugs on the heart is almost identical there is also a difference to be noted. In some cases the dose of atropine which is required to call forth this characteristic inhibitory action on the rate of the ventricle must be ten times larger than a dose of cocaine producing a similar result.

The initial stage of stimulation by cocaine is much shorter, and may likewise be produced by doses considerably smaller than is the case with atropine, and in this lies the main, if not the only, difference between cocaine and atropine in their action on the heart. The only explanation for this difference which I have to offer is that atropine is one of the most powerful muscular stimulants, while the same cannot be said to apply with equal force to cocaine, which latter, probably, exerts a good share of its stimulating influence on the heart through its action on augmentor (Gaskell) or trophic (Ransom) nerve-fibres contained within its substance.

The combined Influence of Cocaine and Atropine on the Heart.

Experiment XV.—April 8, 1885. Terrapin 1505 grms. Lamb's blood and Ringer's saline (1 : 1). Canulas in left superior vena cava and inferior vena cava; in right aorta and pulmonary artery. Venous pressure 5 cm. Arterial pressure 27 cm. Cocainized blood contains 0.002 grm. of muriate of cocaine to 100 c.c. of blood mixture. The solution of atropia used for injection contained 0.1 grm. of the alkaloid to 50 c.c. of Ringer's saline.

Time.	Rate p. min.		Work in c.c.	Temp.	The circulating fluids were supplied to the heart at the time mentioned on the same line in first column.
P.M.	Aur.	Ventr.	p. min.	Cent.	
12.30	...	...	...	...	Terrapin in box.
1.25	27	27	52	18°	
30	27	27	50		
35	27	27	50		
40	27	27	52		
45	27	27	52	...	On cocainized blood for one minute.
46	28	28	60		
47	28	28	43		
48	28	28	42.5	18	
52	28	28	47		
55	28	28	48	...	On cocainized blood for two minutes.
56	28	28	40		
57	28	28	35	...	Immediately after this observation two auricular to one ventric. beat occurred.
2.00	30	15	50		
03	30	15	52		
05	30	30	48	18	Injected five minims of solution of atropine into one of the inflow canulas.
10	30	30	47		
13	31	31	46		
20	31	31	50.5		
22	31	31	52		
25	31	31	45	...	On cocainized blood for two minutes, and fifteen minims of solution of atropine injected into one of the inflow canulas.
30	32	16	47		
32	32	16	53	18.5	
35	32	16	52.5		
38	32	16	50		
41	32	16	53		
50	32	16	49		
55	33	16.5	52		
3.00	33	16.5	53		
05	32	16	52	18.5	
10	32	16	52		
15	32	16	52		
20	32	16	51		
25	32	16	50		
30	32	16	51		
34	...	...	...	...	Normal sequence returned.
35	32	32	20	19	Ventricle small, and in almost constant systolic contraction.
39	32	32	24	...	Auricles somewhat dilated; injected ten minims of atropia.
39.30	...	...	...	...	Cardiac synchronism commenced.
40.30	32	16	45		
42	32	16	47		
50	32	16	55		
55	32	16	55		

Time. P.M.	Rate p. min. Aur.	Rate p. min. Ventr.	Work in c.c. p. min.	Temp. Cent.	The circulating fluids were supplied to the heart at the time mentioned on the same line in first column.
56.30	...	...	...	19°	Normal rhythm returned; auricles slightly distended; ventricle small and constantly in a state of contraction.
59	32	32	25		
4.02	32	32	20.5	...	On cocainized blood two minutes; immediately after two auricular to one ventricular contraction occurred.
04	32	32	20		
07	30	15	42		
09	30	15	41		
11	32	32	16	...	Normal sequence returned at beginning of this observation.
15	32	32	18	19	Injected ten minims of solution of atropia.
16	32	16	41		
20	32	16	48		
22	32	32	20	...	Normal sequence returned at beginning of this observation.
28	32	32	15		
30.30	...	...	...	...	Injected solution of cocaine, same strength as that of atropia, ten minims.
31.30	30	15	47		
35	32	16	42	19	
37	32	16	45	...	Normal sequence returned immediately after the last observation was taken; experiment discontinued.

The Influence of Morphine and Cocaine on the Heart.

Atropine has always been considered one of the physiological antidotes of opium, and cases of opium poisoning are on record where atropine undoubtedly has done good service.

In the year 1874 Dr. W. H. Bentley (*Therapeutic Gazette*, 1880, p. 253) employed coca as a means of curing the opium habit apparently with excellent results; and in 1880 Prof. E. R. Palmer, of the University of Louisville, Ky., reported some very striking examples in testimony of coca as a means of counteracting the habit of opium eating. The similarity in the action of cocaine and atropine on the heart having so far been sustained, and also for reasons above given, it occurred to me to try and ascertain by experiment, in how far the antagonistic properties of cocaine to morphine applied to the heart. Several experiments were, consequently, made with regard to this point, and the following is intended to show the extent of this antagonism existing between cocaine and morphine as far as the heart of the terrapin is concerned.

Experiment VII.—March 14, 1885. Terrapin 625 grms. Beef's blood and Ringer's saline (1 : 1). Inflow canulas in inferior and left superior venæ cavæ. Outflow canulas in pulmonary artery and right aorta. Venous pressure 5 cm. Arterial pressure 20 cm. Cocainized blood contains 0.001 grm. for every 100 c.c. of normal nutrient blood mixture. Morphinized blood the same.

Time. P.M.	Rate p. min. Aur.	Ventr.	Work in c.c. p. min.	Temp. Cent.	The circulating fluids were supplied to the heart at the time mentioned on the same line in first column.
2.30	...	...	...	...	Terrapin in box.
3.15	24	24	18	17°	
20	24	24	18		
23	24	24	18	...	On morphinized blood one minute.
25	25	25	16		
28	25	25	16.5		On morphinized blood two minutes.
30	26	26	16.5		
33	26	26	15.5		
35	26	26	15.5	17	
40	24	24	17		
43	24	24	19.5		
45	24	24	19	...	On morphinized blood fifteen minutes.
47	25	25	21		
49	26	26	21		
51	27	27	18		
4.00	27	27	16	17	On cocainized blood four minutes.
02	25	25	16.5		
04	24	24	14	...	On morphinized blood three minutes.
07	24	24	14	...	Heart smaller than before morphinization.
10	25	25	14	...	Ventricular systole abnormally prolonged.
15	24	24	13.5		
17	24	24	14	...	On cocainized blood three minutes.
21	24	12	19	17	
24	24	12	18		
29	24	24	12	...	On cocainized blood three minutes, immediately after morphinized blood instead of the normal nutrient.
32	24	24	10		
55	24	24	8		
40	24	22	12	...	Ventricle missed two normal contractions.
43	24	24	16	...	On cocainized blood.
46	24	24	15	17	On morphinized blood.
49	24	18	15	...	Left auricle more energetic than right.
51	24	22	14		
54	24	22	13		
58	24	24	12	...	On cocainized blood three minutes.
5.00	24	24	14		
03	24	12	20		
05	24	12	20		
08	24	12	19	...	Heart passed from under influence of cocaine immediately after 5.08 P. M.
15	24	24	14	...	Experiment discontinued.

From this experiment it is concluded that morphine antagonizes the action of cocaine on the heart within certain limits; comparatively large doses of morphine are required to produce this effect.

Influence of Cocaine on the Muscarinized Heart.

Experiment XXVIII.—April 28, 1885. Terrapin 1920 grms., vigorous animal. Calf's blood and Ringer's saline (1 : 1). Inflow canulas in left superior vena cava and inferior vena cava. Outflow canulas in pulmonary artery and right aorta. Venous pressure 6 cm. Arterial pressure 30 cm. Cocainized blood contains 0.004 grm. of Parke, Davis & Co.'s bromide of cocaine in every 100 c.c. of blood mixture. Muscarinized blood contains 0.1 grm. of muscarine (Merk) for 100 c.c. of blood mixture. The solution used in first part contains 0.1 : 50 c.c. of saline.

Time. P.M.	Rate p. min. Aur.	Ventr.	Work in c.c. p. min.	Temp. Cent.	The circulating fluids were supplied to the heart at the time mentioned on the same line in first column.
1.00	...	...	...	...	Terrapin in box.
30	38	38	49	23.5°	
35	38	38	48		
40	38	38	47	...	Injected ten minims of sol. of muscarine into inferior vena cava.
43	38	38	44		
48	39	39	44	...	Injected twenty minims more.
51	39	39	44		
56	40	40	42	...	On musc. blood for two minutes.
58	30	30	65	23.5	Between this and next observation heart was paralyzed for 25 seconds, but quickly recovered.
2.01	21	21	69		
04	38	38	55		
08	38	38	54	...	On cocainized blood for 1½ minutes.
09	...	...	...	...	Two aur. to one ventric. beat commenced.
11	34	17	25		
12	...	...	...	...	No blood being pumped over ; contractions of heart ineffectual.
...	...	...	...	23°	
15	...	...	...	...	Blood beginning to come agaim.
17	36	18	30		
20	38	19	45		
25	38	19	50		
30	38	19	54	...	On muscarinized blood for two minutes; thirty seconds after normal sequence returned but rate is lowered.
32	30	30	50	23	
33	17	17	54		
38	38	38	58	...	On cocainized blood for 1½ minutes.
40	38	19	50		
43	38	19	50	...	On musc. blood for 1½ minutes.
46	33	33	50	...	Twenty seconds after musc. blood was turned on normal sequence returned, rate was lowered.
48	38	38	57	23	
51	38	38	57		
57	38	38	56.5		
3.02	39	39	55		
07	39	39	54	23	Experiment discontinued.

This and the following experiments were made with a view of further testing the action of cocaine on the heart in its relation to muscarine and curari. A careful perusal of Experiment XXVIII. will, I think, show, first, that muscarine in very small doses will slightly increase the rate of beat of the heart, and decrease the work done, apparently manifesting the action of a moderate stimulant; second, that large doses quickly reduce its rate, and finally produce standstill in diastole, from which, however, the heart may recover; third, that cocaine does not prevent the occurrence of muscarine standstill as atropine has been found to do; fourth, that muscarine will quickly restore the characteristic irregular sequence in the contractions between auricles and ventricles set up by cocaine to the normal sequence, at the same time lower the rate of contractions of both.

Influence of Cocaine on the Curarized Heart.

Experiment XXVI.—April 26, 1885. Terrapin 2520 grms., vigorous animal. Calf's blood and Ringer's saline (1 : 1). Inflow canulas in left superior and inferior venæ cavæ. Outflow canulas in pulmonary artery and right aorta.

Venous pressure 6 cm. Arterial pressure 30 cm. Cocainized blood contains 0.004 grm. of Parke, Davis & Co.'s bromide of cocaine to 100 c.c. of normal blood mixture. Curarized blood contains 10 c.c. of 3 per cent. solution to 100 c.c.

Time. P.M.	Rate p. min. Aur.	Rate p. min. Ventr.	Work in c.c. p. min.	Temp. Cent.	The circulating fluids were supplied to the heart at the time mentioned on the same line in first column.
2.00	...	...	...	...	Terrapin in box.
3.00	35	35	64	24°	
05	35	35	63		
10	35	35	62		
16	35	35	62		
20	35	35	61	...	On curarized blood twelve minutes.
22	38	38	73	24	
26	40	40	70		
32	40	40	72	...	On cocainized blood for two minutes.
34	40	20	45		
37	40	20	40		
40	40	20	52	24	
45	38	19	60	...	On curarized blood fifteen minutes.
49	38	19	69		
55	38	38	60		
4.00	40	40	68	...	On cocainized blood five minutes.
02	40	20	72	24	
03	40	20	69		
06	40	30	58		
08	38	38	63	...	Experiment discontinued.

In connection with Experiment XXVI. it is certainly interesting to note the effect of curare on the rate of beat of the heart as well as that on the work done; the former was promptly increased from 35 to 40 per minute, and the latter from 61 to 72 c.c. per minute. Cocainized blood being turned on after curarized blood had run through the heart for the period of twelve minutes the characteristic effect of cocaine on the heart was produced two minutes from that time. The same thing was repeated, and, after fifteen minutes' curarization, cocaine still produced its usual effect; hence, it is concluded, 1, that cocaine acts on a curarized heart as it does on a normal one; 2, curare acts as a stimulant on the isolated heart; 3, if curare paralyzes the vagus endings in the heart, the characteristic action of cocaine on the heart cannot be explained by its possessing a possible stimulating influence on the vagus endings.

C. CAFFEINE.

Dr. R. Amory (*Boston Med. and Surgical Journal*, 1868), in some of his experiments on the physiological action of caffeine, found that the number of the pulsations of the heart was increased; that there was some congestion of the brain and cerebellum after the death of the animal, and that the heart continued to pulsate several minutes after death. He concluded that the drug poisons by exhausting the muscular contractility throughout the body, affecting last of all the muscles of the heart. Voit (*Unters. über d. Einfluss des Kaffee's, etc., auf die Muskelbewegungen*, München, 1868), noticing the peculiar swelling of the muscles which accompanies tetanus produced by caffeine, attributes it not to changes in the muscular substance itself, but to a dilatation of the bloodvessels and consequent exudation of liquor sanguinis. Bennet (*Edinburgh Medical Journal*, 1873), almost invariably found immediately after death from theine (which he used as identical with caffeine) the heart still beating, the bloodvessels engorged with blood, the integument, the thoracic and abdominal viscera deeply congested.

Leblond (*Etude Phys. et Thérap. de la Caffëine*, Paris, 1883), one of the latest investigators of the normal action of caffeine, observed as a *constant phenomenon* a diminution in the frequency of the pulsations of the heart; under physiological doses he obtained a rise in arterial pressure and an increase in the height of the pulse-curves. The rise in blood-pressure he attributes in part to a constriction of the bloodvessels.

Riegel (*Berliner Med. Wochenschr.*, xxi. 19, 1884), upon the recommendation of Huchard (*L' Union Médicale*, Sept. 1882), and Lépine (*Soc. des Sciences Méd. de Lyon*, 1882), experimented with caffeine during a whole year, and from the experience gained he finally concluded that caffeine is equal to digitaline, and even surpasses it in those cases where digitaline is indicated.

C. Becher (*Wiener Med. Bl.*, vii. 21, 1884), experimenting with caffeine almost at the same time as Riegel, and in the same general direction, has also come to the same conclusions.

Both from the renewed therapeutical interest which caffeine has received through the researches of Riegel and Becher, as well as from the supposed similarity of its action to that of cocaine, and also in order to clear up a few of the contradictory results hitherto recorded, with regard to its effects on the pulse-rate and the bloodvessels, it seemed to me desirable to include caffeine in this series of observations.

The following experiments will show that the conclusions of Leblond will have to suffer considerable modification, both as regards the constant slowing effect of caffeine on the pulse-rate, as well as in view of the part played by the bloodvessels in the rise of arterial pressure due to caffeine.

1. *The Influence of Caffein on the Heart.*

Experiment X.—April 1, 1885. Terrapin 610 grms. Beef's blood and Ringer's saline (1 : 1). Inflow canulas in left superior vena cava and inferior vena cava. Outflow canulas in right aorta and pulmonary artery. Venous pressure 5 cm. Arterial pressure 20.5 cm. Caffeinized blood contains 0.2 grms. of bromide of caffeine in every 300 c.c. of blood mixture.

Time. P.M.	Rate p. min.	Work in c.c. p. min.	Temp. Cent.	The circulating fluids were supplied to the heart at the time mentioned on the same line in first column.
12.00	...	...	...	Terrapin in box.
35	34	34.5	21°	
45	34	35		
1.00	34	35		
10	34	35		
15	34	35		
20	34	35	...	On caffeinized blood one minute.
22	36	37		
24	36	36		
26	36	43		
34	37	43		

Time. P.M.	Rate p. min.	Work in c.c. p. min.	Temp. Cent.	The circulating fluids were supplied to the heart at the time mentioned on the same line in first column.
38	38	44		
48	38	45	...	On caffeinized blood one minute.
50	38	47		
55	40	47		
2.02	40	47		
07	40	47		
12	40	48	...	On caffeinized blood two minutes.
14	40	50		
17	40	47		
21	40	47.5		
30	40	49		
35	40	47	...	On caffeinized blood (0.4:300 c.c.) 1 min.
37	41	51		
41	41	46		
45	42	49		
50	41	46		
55	41	48	...	On caffeinized blood (0.4:300 c.c.) 1 min.
57	43	49		
3.02	43	49		
10	43	48		
15	45	45		
20	44	45	...	On caffeinized blood, as above, 2 minutes.
25	42	46		
30	42	46		
32	40	49		
34	42	46		
36	42	46		
41	43	50		
45	42	47		
50	41	47.5	...	On caffeinized blood, as above, 3 minutes.
51	42	46		
55	42	46		
4.00	42	46		
06	40	42		
08	41	42	...	On caffeinized blood (0.6:300 c.c.) 3 min.
13	41	44		
18	40	43		
22	41	43		
28	40	40		
32	40	42		
50	40	42		
5.00	40	41	...	On caffeinized blood (0.6:300 c.c.) 5 min.
02	37	35		
05	22	26		
09	37	40		
13	40	42		
17	42	43	...	Experiment discontinued.

During the whole length of the preceding experiment the regular rhythmical sequence in the contractions of the heart never varied from its normal standard; it was perfect and vigorous. The influence of caffeine in relatively small doses upon the rate, is, I think, well shown. It decidedly increases the rate of beat at the same time that it renders the contractions stronger and increases the work done, and it was only when very strongly caffeinized blood was used for a longer space of time than in the previous observations that the rate and work went down. During this time the heart's action became somewhat sluggish, the auricles were larger than normal, contracting imperfectly, the ventricle contracted peristaltically and incompletely. The entire heart, however, quickly recovered under normal blood. From this experiment it is further concluded that caffeine possesses a slight cumulative action.

2. *Influence of Caffeine on the Bloodvessels.*

Experiment XVIII.—April 11, 1885. Terrapin 1340 grms. Ringer's saline. Inflow canulas placed in the right and left aortic trunks. Outflow canula in sinus. Brain and cord destroyed. Caffeinized saline contains 0.08 grm. of bromide of caffeine (Mercks) in every 100 c.c. of saline. Venous pressure 0. Arterial pressure 16 c.m.

Time P. M. From	to	Temp. Cent.	Total outflow.	Outflow p. min.	The circulating fluids were supplied to the vessels at the time mentioned on the same line in second column.
3.00	3.25	...	...	...	Terrapin in box.
35	37	17°	28.5	14.2	
37	39	...	27.5	13.7	
39	41	...	26	13	
41	43	...	25	12.5	
43	45	...	25	12.5	
45	47	...	26	13	
47	49	...	27	13.7	
49	51	17	30	15	
51	53	...	29	14.5	
53	55	...	31.5	15.7	
55	57	...	30	15	
57	59	...	30	15	
59	4.01	...	30	15	
4.01	03	...	32	16	On caffeinized saline two minutes.
03	07	17.5	10.6	26.5	
07	09	...	56	28	
09	11	...	26	14.5	
11	13	...	16	8	
13	15	...	15.5	7.7	
15	17	...	19	9.5	
19	19	...	15	7.5	
19	21	17.5	18	9	On caffeinized saline one minute.
21	23	...	20	10	
23	25	...	54	27	
25	27	...	29	14.5	
27	29	...	15	7.5	On caffeinized saline one minute.
29	31	...	22	11	
31	33	...	55	27.5	
33	35	17.5	31.5	15.7	
35	37	...	21	10.5	On caffeinized saline one minute.
37	39	...	23.5	11.7	
39	41	...	52	26	
41	43	...	34.5	17.2	
43	45	...	23	11.5	
45	4.47	...	21	10.5	On caffeinized saline one minute.
47	49	18	29	14.5	
49	51	...	46.5	23.2	
51	53	...	41.5	20.7	
53	55	...	18.5	9.7	
55	57	...	27	13.5	
57	59	...	28	14	
59	5.01	...	24	12	
5.01	03	18	35	17	
03	05	...	28	14	
05	07	...	20	10	On caffeinized saline two minutes.
07	09	...	41	20.5	
09	11	...	51	25.5	
11	13	...	41.5	20.7	
13	15	18	41.5	20.7	
15	17	...	41.5	20.7	
17	19	...	42	21	On caffeinized saline four minutes.
19	21	...	21	10.5	
21	23	...	45	22.5	
23	25	...	82.5	41.2	
25	27	...	78	38	
27	29	...	56	28	
29	31	18.5	45	22.5	
31	33	...	35	17.5	On caffeinized saline six minutes.
33	35	...	36	18	

Time P. M. From.	to.	Temp. Cent.	Total outflow.	Outflow p. min.	The circulating fluids were supplied to the heart at the time mentioned on the same line in first column.
35	37	...	63	31.5	
37	39	...	83	41.5	
39	41	...	77	38.5	
41	43	...	66	33	
43	45	18.5°	45	22.5	
45	47	...	38.5	19.2	
47	49	...	32	16	
49	51	...	27	13.5	
51	53	...	28.5	14.2	
53	55	...	26	13	
55	57	...	28.5	12.2	
57	59	18.5	24.5	12.2	
59	6.01	...	24	12	Experiment ended.

Experiment XXVII—April 22, 1885. Terrapin 2010. Ringer's saline. Caffeine solution which was injected was a saturated solution of caffeinum bromidum in Ringer's saline. Inflow canulas in right and left aorta. Arterial pressure 20 cm. Outflow canula in sinus. Venous pressure 0. Brain and spinal cord destroyed. Interrupted pressure used.

Time P. M. From	to	Temp. Cent.	Total outflow.	Outflow p. min.	The circulating fluids were supplied to the vessels at the time mentioned on the same line in second column.
3.15	...	...	...	...	Terrapin in box.
31	33	28°	25	12.5	
33	35	...	25	12.5	
35	37	...	25	12.5	
37	39	...	25	12.5	
39	41	...	22	11	
41	45	...	50	12.5	
45	47	...	23	11.5	
47	49	...	20	10	
49	52	...	31	10.3	
52	54	...	24	12	
54	56	...	28	14	On caffeinized saline.
56	58	...	20	10	
58	4.00	...	18	9	
4.00	02	...	16.5	8.25	
02	04	...	33	16.5	
04	06	...	34	17	On normal saline.
06	08	...	25	12.5	
08	10	...	25	12.5	
10	12	...	32	16	Injected 20 minims of caffeinized saline.
12	14	...	32	26	
14	16	...	52	26	
16	18	...	27	13.5	
18	20	...	15	7.5	Injected 20 minims of caffeinized saline.
20	22	...	25	12.5	
22	24	...	30	15	
24	26	...	25	12.5	Injected 20 minims of caffeinized saline.
26	28	...	25	12.5	
28	30	. .	30	15	
30	33	...	31	10.3	Injected 23 minims of caffeinized saline.
33	35	...	33	16.5	
35	37	...	25	12.5	
37	39	...	24	12	
39	42	...	35	11.6	
42	48	...	68	11.3	On caffeinized saline.
49	52	...	37	12.3	
52	54	...	70	35	
54	56	...	74	37	Experiment discontinued.

The first observation with caffeine in this experiment was evidently followed by diminished outflow, which might have been due to a contraction of the arterioles. Thinking that perhaps very small doses might normally produce this effect from the start, instead of running caffeinized saline through the vessels, normal saline was turned on, and occasional injections of 20 mimims of the solution made directly into the circulation, and the result was invariably an increase in the outflow denoting a slight dilatation of the arterioles. When towards the end of the experiment again caffeinized saline was turned on for eight minutes, the outflow per minute became about three times that of the normal, showing that the effect is constant, and that the first decrease in the outflow must have been due to other causes.

The conclusion, therefore, is that caffeine in small as well as large doses produces dilatation of the bloodvessels in the terrapin; any rise in arterial pressure due to caffeine is, consequently, to be explained only by the stimulating effect caffeine exerts on the heart itself.

EXPLANATION OF PLATES.

All the tracings were taken by means of a mercury manometer connected with the cardiac end of the outflow tube, and to be read from left to right.

PLATE I.

From Experiment XXIV.—*a*, normal tracings; *b* and *c*, beginning to show the effect of cocaine, and finally passing into "*d*," the state in which two auricular to one ventricular contractions occur; of the two auricular contractions, one is pre-systolic, the other post-systolic. The tracings shown in "*b*" and "*c*" do not always occur, and more often, especially after the first observation has been made, the transition from the normal to the abnormal sequence is sudden.

PLATE II

Tracings "*a*" and "*b*" are from Experiment XXV., with atropine.—"*a*" showing the primary effect of stimulation of the ventricle when it becomes reduced in size, but is still beating at an increased rate and following the auricular contractions regularly; "*b*" shows the condition in which two auricular and one ventricular beats occur.

Tracings "*c*" and "*d*" are from Experiment XV., showing the effect of cocaine and atropine combined on the heart. Note the diastolic descent in the curves, not seen when either of the drugs is used alone. The same will be noticed in "*e*" and "*f*," which are taken from Experiment XXVIII., with cocaine and muscarine combined, showing that either cocaine and atropine, or cocaine and muscarine, act on the heart in the same general direction.

PLATE I.

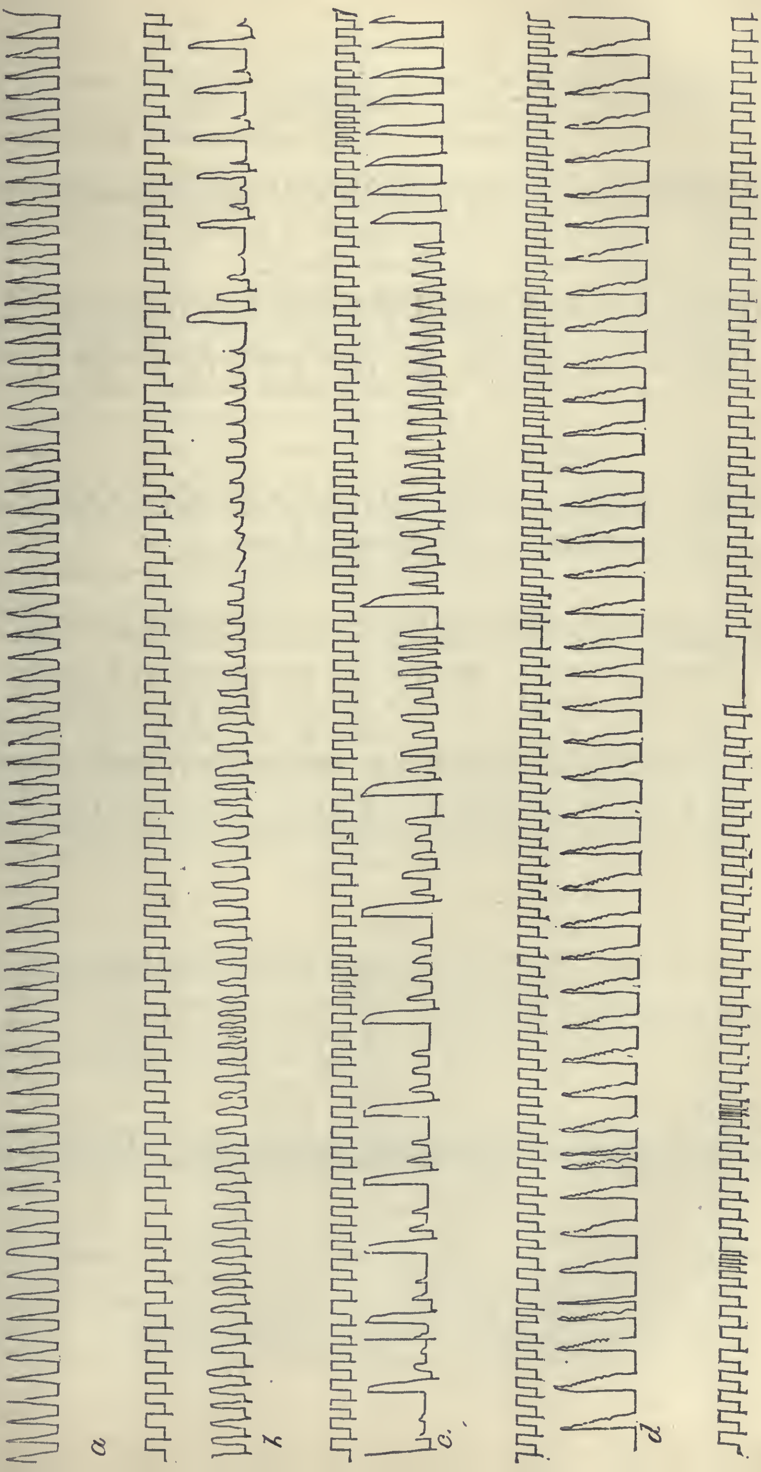
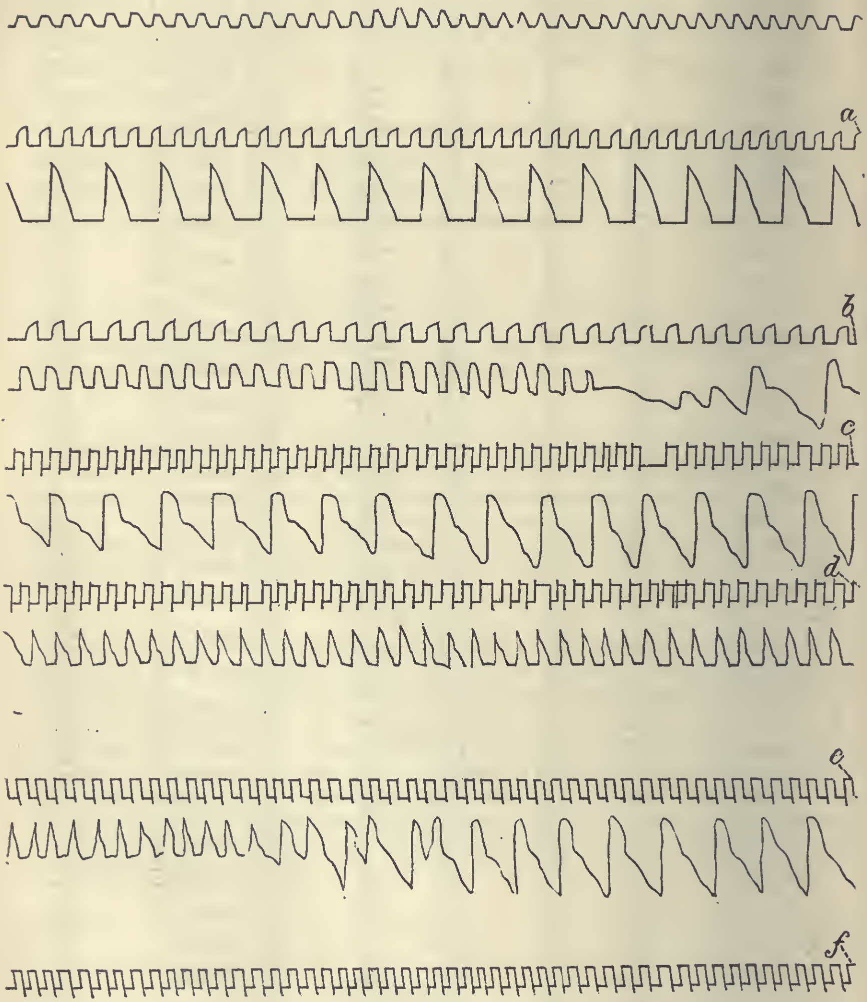


PLATE II.



Article III.

Nephrectomy: Its Indications and Contraindications.[1]

By Samuel W. Gross, A.M., M.D., Professor of the Principles of Surgery and Clinical Surgery in the Jefferson Medical College of Philadelphia.

Of 233 cases of extirpation of the kidney which I have collated from public and private[2] sources of information 129 recovered, and 104, or 44.63 per cent., died. Of the entire number, 111 by the lumbar incision indicate 70 survivals and 41 deaths, the mortality being 36.93 per cent., while of 120 by the ventral incision 59 recovered, and 61, or 50.83 per cent., perished. In the remaining 2 cases, both of which proved fatal, the nature of the operation is uncertain.

It is thus to be perceived that the fatality of the abdominal operation is greater by 13.90 per cent. than that of the lumbar operation, a difference which several distinguished laparotomists ascribe to the removal of healthy kidneys after a wound of the loin, or for some condition in which they are not diseased. This statement is, however, incorrect. For ureteral fistulæ, rupture of the ureter, protrusion through the loin, a painful condition, and excessive mobility, healthy or injured kidneys have been removed in 39 cases. Of these, 19 were by the lumbar incision, with 4 deaths, or a mortality of 26.31 per cent., and 20 by the ventral incision, with 8 deaths, or a mortality of 40 per cent. The greater success of the lumbar operation is also shown by a comparison of the two methods for diseased kidneys. Thus, if we omit the 39 cases just referred to, along with 5 in which the organ or ureter was injured during the extirpation of abdominal tumors, or the kidney was inseparably attached to uterine or retroperitoneal tumors, 92 lumbar operations indicate 37 deaths, or a mortality of 40.21 per cent., and 95 abdominal operations show 48 deaths, or a mortality of 50.52 per cent. The nature of the disease for which the kidney is extirpated, however, influences the result, since we find that the mortality is less by 25, 16.17, 8.67, and 19.41 per cent., respectively, for suppurative lesions, hydronephrosis, painful floating kidney, and malignant growths, while it is greater by 39.56 per cent., for tubercular kidney, after the lumbar operation. Hence, we may conclude in a general way that the lumbar operation is the safer.

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[1] Read before the American Surgical Association, April 21, 1885.

[2] Of the 34 unpublished nephrectomies utilized in the preparation of this paper, I have to thank Bardenheuer for 14, Czerny for 6, Martin for 3, Bantock for 3, Savage for 2, Marcus Beck for 2, Elder for 1, Kœnig for 1, Henry Morris for 1, and Thomas Smith for 1. I have also to express my thanks to Knowsley Thornton for a list of 11 nephrectomies, 3 nephrolithotomies, and 4 nephrotomies; to Lawson Tait for a list of 3 nephrectomies and 12 nephrotomies; to Bryant for 13 nephrotomies; to Savage for 2 nephrotomies; to Peruggi for all the nephrectomies done in Italy; to Tscherning for all the nephrectomies performed in Copenhagen; to Barker for all the nephrectomies done at the University College Hospital; to Gaillard Thomas for notes of his 3 cases of nephrectomy; to Hicquet for the termination of his case of nephrectomy for sarcoma; to Pepper for an unpublished nephrolithotomy; to Israel for an unpublished nephrotomy; and to Henry Morris for 1 unpublished nephrolithotomy, 2 exploratory operations for renal calculus, 3 nephrotomies, and for many references to all of these operations. It should be stated that the statistics are brought up to May 15, and that cases reported merely as doing well several days after operation are excluded.

The following table of the causes of death after the lumbar and abdominal methods shows at a glance not only the dangers of nephrectomy, but the comparative frequency of the different causes after each operation:—

Causes of Death.	Abdominal.	Percentage.	Lumbar.	Percentage.
Shock	20	32.79	16	40.00
Peritonitis	13	21.31	1	2.50
Septic peritonitis . . .	8	13.11	0	
Uræmia	4	6.55	2	5.00
Exhaustion	4	6.55	4	10.00
Septicæmia and pyæmia . .	3	4.91	7	17.50
Anuria	2[1]	3.27	6[2]	15.00
Infarction	2	3.27	0	
Hemorrhage	4	6.55	0	
Secondary hemorrhage . .	1	1.63	1	2.50
Suppuration of opposite kidney .	0	. . .	1	2.50
Vomiting	0	. . .	1	2.50
Convulsions	0	. . .	1	2.50
	61		40[3]	

From the above comparison it appears that peritonitis, septic peritonitis, pulmonary embolism, primary hemorrhage, and uræmia are more common causes of death after abdominal extirpation of the kidney than after lumbar, and that shock, exhaustion, septicæmia, pyæmia, anuria, secondary hemorrhage, suppuration, convulsions, and vomiting are more frequent causes of death after lumbar nephrectomy than after abdominal. In other words, by selecting the lumbar operation the risks of peritonitis are reduced to a minimum, septic peritonitis is unheard of, as are also pulmonary embolism and primary hemorrhage, which were the causes of upwards of six-tenths of the deaths after the abdominal operation.

Such are the general statements in regard to nephrectomy; but to draw any conclusions as to the real value of this grave operation, it must be considered in connection with the various diseases or lesions for which it has been performed, and compared with other modes of treatment. From an extensive acquaintance with the literature of the subject, I have been long convinced that the kidney has been too frequently removed; and it is for this reason, as well as for the purpose of comparing the relative value of nephrectomy, nephrotomy, nephrolithotomy, nephrorrhaphy, and other surgical measures, and concluding which of these operations should be resorted to in particular cases, that I have undertaken the present inquiry.

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[1] The opposite kidney was diseased in one.

[2] The opposite kidney was diseased in four.

[3] The cause of death is unknown in one.

1. *Suppurative Lesions.*—For pyonephrosis, pyelitis, and abscess, including one example of abscess after a shot wound, and one of suppuration following traumatic rupture, the kidney has been removed 50 times,[1] with 28 recoveries and 22 deaths, or a mortality of 44 per cent. Of the 40 lumbar operations, 26 recovered and 14, or 35 per cent., succumbed, while of the 9 ventral incisions, 2 recovered and 7, or 77.77 per cent., died. The remaining one case, in which the nature of the operation is unknown, proved fatal. The cause of death was determined in 20, of which 5 were from shock, 2 from shock and disease of the remaining kidney, 4 from septicæmia, and 1 each from pyæmia, primary hemorrhage, secondary hemorrhage, uræmia, suppression of urine, vomiting, peritonitis, convulsions, and exhaustion. In 1 of the fatal lumbar operations the pleura was wounded, while in 2 the peritoneal cavity was opened, and one recovered. In 8 cases the kidney had been previously drained by nephrotomy, and 7 recovered.

Incision with drainage of suppurating kidneys has been practised in 72 cases,[2] of which 59 recovered and 13, or 18.02 per cent., died; 67 were by the lumbar incision, with 12 deaths, and 5, in the hands of Lawson Tait, were by the ventral incision, of which 1 perished. Of the 59 survivors, sinuses or fistulæ persist in 19, or 32.20 per cent.

For calculous pyelitis, nephrectomy has been done 23 times,[3] with 13 recoveries and 10 deaths, or a mortality of 43.47 per cent. Of the 16 operations through the loin, 9 recovered and 7, or 43.75 per cent., perished, while of the 7 ventral operations, 4 recovered and 3, or 42.85 per cent., died. The cause of death was shock in 4, shock and disease of the opposite kidney in 1, anuria in 2, the other kidney being involved in one, and exhaustion, peritonitis, and pyæmia each in 1. Previous nephrotomy had been resorted to in 4, all of which recovered.

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[1] The operators were Bardenheuer in 12 cases; Czerny in 7 cases; Tait and Von Bergmann, each in 2 cases; Barwell, Beck, Clementi, Couper, Dandridge, D'Antona, De Vecchi, Dumreicher, Duncan, Elder, Frattina, Israel, Kidd, Lange, Lloyd, Marsh, Ollier, Palmer, Roberts, Savage, Stockwell, Studsgaard, Von Bruns, Von Mandach, Weir, West, and Whitehead, each in 1 case.

[2] The operators were Bryant in 9 cases; Tait in 7 cases; Thornton in 4 cases; Barker, Gardner, Morris, Parker, and Wheelhouse, each in 2 cases; and Angelini, Baker, Bardenheuer, Barwell, Beck, Burrell, Callender, Crane, Czerny, Datillo, Elder, French, Goodridge, Gueterbock, Holmes, Israel, Ker, Keys, Krannhals, Kuester, Landau, Lange, Lente, Lister, Lucas, Ollier, Paterson, Puzey, Raffa, Reeves, Roddick, Rosenberger, Savage, Southey, Studsgaard, Van Buren, Von Bergmann, Von Muralt, Weir, West, Williams, and Wright, each in 1 case.

[3] The operators were Barker, Godlee, and Thornton, each in 2 cases; and Bantock, Barwell, Bottini, Israel, Lange, Macewen, McClelland, Müller, Novaro, Rosenbach, Simon, Thomas Smith, Sonnenburg, Tait, Urbinati, Von Bergmann, and Wright, each in 1 case.

Nephrotomy for calculous pyelitis has been resorted to 21 times,[1] with 12 recoveries and 9 deaths, or a mortality of 42.85 per cent. Of the recoveries a sinus remained in 1, and in 1, a case of Bryant's, a urinary fistula persists at the end of eight years.

It will thus be seen that of 73 nephrectomies for suppurative lesions from all causes, 41 recovered and 32, or 43.97 per cent., died. Of 93 nephrotomies, on the other hand, 71 recovered and 22, or 23.65 per cent., died. It, moreover, appears that of 12 nephrectomies after a previous nephrotomy only 1, or 9.33 per cent., succumbed, while of 61 nephrectomies without preliminary incision and drainage, 31, or 50.81 per cent., perished. In other words, the mortality of removal of the kidney for suppurative conditions is nearly twice as great as after nephrotomy, and a preliminary nephrotomy diminishes the risks of nephrectomy by 41.48 per cent. Hence, we may conclude that a suppurating kidney should never be excised until after the failure of nephrotomy, the only inconvenience of which is that a permanent sinus or urinary fistula remains in 29.57 per cent. of the recoveries, either of which may, however, should it prove a source of discomfort, be remedied by subsequent lumbar extirpation of the shrunken sac, with the risk of only 9.33 per cent. In favor of a preliminary nephrotomy, it is also to be declared that it enables us to determine with almost a certainty the condition of the opposite organ, that is to say, if, after a few days of drainage, pus ceases to appear in the urine, the probability is that the other kidney is sound.

2. *Tubercular Kidney.*—The kidney has been extirpated for so-called strumous disease 20 times,[2] of which 12 recovered, and 8, or 40 per cent., died—3 from exhaustion, along with disease of the opposite kidney in one, and tubercle of the bladder in one, 2 from shock, 2 from suppression of urine, in both of which the remaining organ was similarly affected, and 1 from tubercle of the opposite kidney and of the lungs. Of the 13 operations through the loin 6 recovered, and 7, or 53.84 per cent., succumbed, while of 7 ventral operations 6 recovered, and 1, or 14.28 per cent., died. Previous nephrotomy had been resorted to in 8, with 5 recoveries and 3 deaths, or a mortality of 37.5 per cent., whereas primary extirpation was attended with a mortality of 41.66 per cent. In 10 of the recoveries in which the fate of the patient is known, 1 expired in four months from tubercle of the opposite kidney, 1 received no benefit, the bladder and re-

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[1] The operators were Bryant in 2 cases, and Anderson, Baker, Beck, Callender, Clark, Couper, Cullingworth, Dawson, Durham, Haward, Hulke, Ingalls, Israel, Jones, Mynter, Richardson, Rose, Seymour, and Studsgaard, each in 1 case.

[2] The operators were Thornton in 3 cases, and Baker, Bantock, Beck, D'Antona, Elder, Golding-Bird, Jowers, Lucas, Martin, May, O'Reilly, Peters, Raffa, Tscherning, Von Muralt, Wright, and Wylie, each in 1 case.

maining organ being diseased, while 8 were living and well at the expiration, respectively, of two months and twenty days, five months, five months, ten months, twenty-six months, thirty months, three years, and nearly four years.

It will thus be seen that in 7 of the 20 cases there was tubercle of the opposite kidney in 4, of the bladder in 1, and general tuberculosis in 2. Hence, present experience shows that tubercle is limited to a single kidney in only 65 per cent. of all cases, which renders the prognosis far more grave after nephrectomy than after removal of the kidney for suppurative lesions from ordinary causes. In the 8 cases of preliminary nephrotomy relief was not afforded; so that it appears as if previous incision might be wisely refrained from, and the kidney be extirpated in the early stage of tubercular disease, especially as excision may relieve the patient of a source of general infection. In performing the operation we ought, if possible, to ascertain the condition of the opposite organ; and as this may be done by the ventral incision, which is attended with a mortality of 14.28 per cent., as against 53.84 per cent. for the lumbar operation, we may conclude that primary exploration and removal by the abdominal incision is the proper procedure for the early stage of tubercular kidney. In advanced cases, on the other hand, especially if the morbid changes be not limited to the kidney, nephrectomy is clearly unjustifiable, and nephrotomy should be resorted to.

3. *Hydronephrosis.*—There are 21[1] recorded cases of nephrectomy for hydronephrosis, including 5 due to calculi, the case of Heywood Smith being omitted as the result is unknown. Of these 21, 13 recovered, and 8, or 38.09 per cent., died. Of 17 ventral operations, 10 recovered, and 7, or 41.17 per cent. succumbed, while of 4 lumbar operations, 3 recovered, and 1, or 25 per cent., died. Of the survivors, 2 had been subjected to nephrotomy, and a fistula remained in 1. The cause of death was shock in 3, peritonitis in 2, septic peritonitis in 2, and anuria from disease of the opposite kidney in 1.

Incision with drainage of hydronephrotic kidneys has been practised in 25 cases,[2] of which 21 recovered, and 4, or 16 per cent., perished. Of 14 ventral incisions, 11 recovered, and 3, or 21.42 per cent., died, while of 11 lumbar incisions, 10 recovered, and 1, or 9.09 per cent., died. Of the 20 survivors, urinary fistulæ persist in 11, or 55 per cent. In one of these cases, Mr. Henry Morris writes me that about ten ounces of urine are passed daily into a receiver adapted to the loin, and that the patient suffers neither inconvenience nor discomfort. In a second case, recorded by Taylor, the ruptured sac was stitched to the abdominal wound, and the patient passes urine freely through a glass tube, much to her discomfort. In the cases of Le Dentu and Spiegelberg the trouble was remedied by removal of the kidney.

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[1] The operators were Thornton in 3 cases; Bardenheuer, Czerny and D'Antona, each in 2 cases; and Billroth, Cullingworth, Day, Goodell, Heath, Le Dentu, Kehrer, Savage, Schede, Spiegelberg, Thiersch, and Thomas, each in 1 case.

[2] The operators were Czerny in 3 cases; Simon and Weir, each in 2 cases; and Ahlfeld, Baum, Cabot, Kœnig, Le Dentu, Landau, Leisrink, Morris, Pernice, Peters, Savage, Schramm, Spiegelberg, Svensson, Taylor, Tuckwell, Sir Spencer Wells, and Winckel, each in 1 case.

Of the remaining operations for hydronephrosis, 15 cases of puncture, of which I possess notes, resulted in 12 deaths, 1 cure, and 2 temporary improvements, while of 5 examples of injection with tincture of iodine, 2 were cured, and 3 died. Hence, further efforts in these directions should be abandoned. Of 6 instances of aspiration, 3 were cured, 2 improved, and 1 died of a cause not connected with the operation.

We have thus seen that aspiration is a perfectly safe procedure; that lumbar nephrotomy yields fewer deaths by 15.91 per cent. than does lumbar nephrectomy; and that the latter operation is safer by 16.17 per cent. than is the ventral operation. Hence, in cases of hydronephrosis, lumbar aspiration, repeated if it be necessary several times, should first be resorted to. In the event of its failure, nephrotomy should then be practised. Should an annoying urinary fistula result, the kidney may be removed through the loin, as a final resource.

4. *Cysts.*—For cysts of various kinds, the kidney has been removed 15 times,[1] with 8 recoveries and 7 deaths, or a mortality of 46.66 per cent. With one exception, all the operations were ventral, and the cause of death was peritonitis in 2 cases, and shock, infarction of the lungs, secondary hemorrhage, septicæmia, and pyæmia, each in 1 case.

Nephrotomy for cysts has been done in 7 cases[2] by the ventral method, all of which recovered, and in Mr. Thornton's case, both kidneys were drained. These results speak for themselves. Nephrotomy should always be tried at the outset, unless it be deemed wise to first resort to the simpler remedy, aspiration. Should nephrectomy unfortunately be decided upon, the same rule should guide us as in nephrectomy for hydronephrosis, since it is probable that all cysts can be removed by the loin after previous drainage.

5. *Painful Floating Kidney.*—Floating kidneys have been extirpated 22 times,[3] with 13 recoveries and 9 deaths, or a mortality of 40.90 per cent. Of 19 ventral operations, 11 were cured, and 8, or 42.10 per cent., succumbed, while of 3 lumbar operations, 2 recovered, and 1, or 33.33 per

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[1] The operators were Bardenheuer, Burgess, Campbell, Claus, Czerny, D'Antona, Esmarch, Getz, Keeling, Landi, Leopold, Maclean, Meadows, Ollier, and Walter. The case of Spiegelberg is omitted, as the removal was incomplete. It was a ventral operation, and death ensued from shock.

[2] The operators were Tait in 5 cases, and Thornton and Heusner, each in 1 case.

[3] The operators were Martin in 8 cases; Langenbuch in 2 cases; and Billroth, Boothby, Gilmore, Hennig, Jurié, Lane, Martini, Merkel, Navratil, Polk, Smyth, and Stimson each in 1 case.

cent., died. Although not strictly a lumbar operation, Polk's fatal case of extirpation of a floating solitary kidney is included in the latter class, as the incision was extraperitoneal. The cause of death in the 8 fatal cases was peritonitis in 4, uræmia in 2, and septic peritonitis and shock, each in 1 case.

Nephrorraphy has been practised 18 times,[1] with 1 death, or a mortality of 5.55 per cent. The operation, however, utterly failed to fix the kidney in 4 of the survivors, and in 3 the success was only partial. Hence, although it has not afforded relief in 43.33 per cent. of all cases, its comparative freedom from danger warrants the conclusion that nephrectomy should never be performed for a movable kidney until mechanical appliances and stitching the organ to the posterior abdominal wall have failed to relieve suffering. In this event it may be removed, as has been successfully done by Gilmore and Jurié; and, although the ventral operation may be easier, especially if there happens to be a long mesonephron, its high rate of mortality from peritonitis should induce the surgeon to select the lumbar incision, through which the organ may almost invariably be readily removed.

6. *Malignant Growths.*—Carcinomatous and sarcomatous kidneys have been extirpated in 49 cases, of which 19 recovered, and 30, or 61.22 per cent., died. Of 37 ventral operations, 13 recovered, and 24, or 64.86 per cent., succumbed, while of 11 lumbar operations, 6 survived, and 5, or 45.45 per cent., perished. Of the survivors, there were recurrence and death in 7, 1 died of an unknown cause, 1 was alive with recurrence, 7 remained well for twenty-eight months and a half on an average, and 3 were living for periods varying from three weeks to two months after operation, whence they are scarcely available for the determination of the final result. In a general way it may, therefore, be said that 61.22 per cent. of all cases die as the direct result of the procedure; that 16.32 per cent. perish subsequently; that 12.24 per cent. appear to make a permanent recovery; and that the lumbar incision is far less dangerous than the ventral. In order, however, that the true value of nephrectomy for malignant disease may be properly estimated, it is necessary that sarcoma and carcinoma be examined separately.

The kidney has been removed for sarcoma 33 times,[2] with 14 recoveries and 19 deaths, or a mortality of 57.57 per cent. Of 26 ventral operations, 11 recovered, and 15, or 57.69 per cent., died, while of 7 lumbar operations, 3 recovered, and 4, or 57.14 per cent., perished. The cause of death was shock in 7, hemorrhage and septic peritonitis, each in 3, septicæmia and exhaustion, each in 2, and pulmonary embolism and tetanus, each in 1. Of the 14 survivors, 6 subsequently died, 1 from an unknown cause, and 5 from metastases at the expiration, respectively, of five months, five months and three weeks, six months, nine months, and eighteen months, while 1 was living with recurrence at the end of four months, and 5 were alive and well at the end, respectively, of seventeen, twenty-two, and twenty-three, and thirty-five months, and five years, the cases being those of Billroth, Lossen, Thornton, Bardenheuer, and Martin. In the remaining 2 cases the history terminates with the mere statement that the patient recovered. In other words, 57.57 per cent. died as the direct result of the operation, while, of the survivors, 42.85 per cent. died subsequently, and 35.71 per cent. remained well for thirty-one months and a half on an average.

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[1] The operators were Hahn in 5 cases; and Agnew, Bassini, Ceccherelli, Dunning, Esmarch, Gardner, Gilmore, Jurié, Kuester, Newman, Svensson, Von Bergmann, and Weir, each in 1 case.

[2] The operators were Czerny in 6 cases; Bardenheuer in 3 cases; Kœnig in 2 cases; and Billroth, Bantock, Barker, Godlee, Heath, Hicquet, Hueter, Jessop, Kocher, Little, Lossen, Martin, Meredith, Morris, Ollier, Rawdon, Réczey, Schœnborn, Tait, Thornton, Von Bergmann, and Whitehead, each in 1 case. Langenbuch's case of recovery after the lumbar incision is omitted, as the organ, converted into a cyst, was thrown away, and could not be examined. The fatal cases of Kocher, Israel, and Thiersch are also omitted, as the adhesions were so great that the diseased kidneys were not removed. Trendelenburg also opened the belly, but the extreme vascularity of the tumor prevented him from attempting its removal. The child recovered.

The ages of 16 of the subjects ranged between sixteen months and seven years. Of these 16 children, 7 survived, and 9, or 56.25 per cent., perished. Of the 7 survivors, the patient of Kœnig was living with recurrence at the end of four months, while the patients of Bardenheuer, Godlee, Jessop, and Hicquet died of recurrence, respectively, in five, six, nine, and eighteen months. In the remaining 2 there is no further history. In 2 of the deaths, secondary deposits were found in other organs. The remaining 17 patients were adults. Of these, 7 recovered, and 10, or 58.82 per cent., died. Of the survivors, 1 died from an undetermined cause; 1 died from metastasis; and 5 were well at the end of thirty-one months and a half on an average. From these data we may conclude that nephrectomy for sarcoma in children should not be repeated, but that in adults it is eminently justifiable, as it apparently cures 29.41 per cent. of the cases. Should the tumor be small, the lumbar incision is the preferable one.

Nephrectomy for carcinoma has been practised in 14 cases,[1] of which 4 recovered, and 10, or 71.42 per cent., perished. All of the 9 abdominal sections, with 1 exception, were fatal, 1 of the 4 lumbar operations died, and 1 died, the nature of the operation being unknown. The cause of death was determined in 9 cases, of which 2 each were due to uræmia, shock, and peritonitis, and 1 each to metastasis, exhaustion, and anuria, the opposite kidney being cystic and contracted. Of the 4 survivors 2 died of secondary growths at the expiration, respectively, of forty-four days and two months, and the remaining 2 were alive at the end, respectively, of two months and thirteen months. Hence, carcinoma should be excluded from the category of cases for which nephrectomy should be done.

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[1] The operators were Adams, Albert, Czerny, Davy, Esmarch, S. W. Gross, Homans, Halsted, Lücke, Martin, Péan, Thomas, Vercelli, and Sir Spencer Wells.

In 2 other cases the kidney has been extirpated by the ventral operation for malignant disease. The case of Wolcott, one probably of medullary carcinoma from the age of the patient, who was fifty-eight years old, died of exhaustion, while that of Byford was living at the end of twenty-eight months. As the subject was thirty-six years of age, the disease was probably sarcomatous. Hence, these additional cases of malignant disease confirm our conclusion that nephrectomy is indicated in sarcoma of adults, and contraindicated in carcinoma.

7. *Other Neoplasms.*—Czerny removed an adenomatous kidney of a child eleven months of age by the ventral operation, and death ensued from septic peritonitis. Thomas and Bruntzel succeeded in saving their patients after laparotomy for fibroma of the capsule of the kidney; and Billroth operated successfully through the loin for papilloma. Peaslee removed a "solid" tumor by laparotomy, but the patient died of peritonitis. For benign tumors, 4 nephrectomies indicate, therefore, 3 recoveries and 1 death, or a mortality of 25 per cent., so that the operation is eminently justifiable.

8. *Calculus.*—The otherwise healthy kidney has been extirpated for calculus by Czerny, Kosinski, and Morris. All of the patients recovered, 2 of the operations having been performed through the loin, and 1 through the belly. Despite these favorable results, no prudent surgeon will sacrifice the organ until all methods of exploration, including incision of the kidney itself, have failed to detect the concretion. When the organ is not dilated by pus or urine, in other words, when its secreting power is not materially damaged, the only operation that is at all justifiable is nephrolithotomy, an operation of which I have a record of 21 cases.[1] Of these, 2, or 9.52 per cent., died—the patent of Cullingworth from the blocking of the opposite ureter by a stone near its vesical orifice, while that of Pepper expired suddenly, in consequence probably of the effects of morphia. Thornton's cases were by the combined ventral and lumbar incision, and all recovered; but under no circumstances should any except the lumbar incision be resorted to, unless there is doubt as to which kidney is involved. In 3 of the cases the stone was removed through an incision in the pelvis of the kidney, and in 2 cases the stones weighed, respectively, nearly an ounce, and five hundred and fifty-six grains. All of the recoveries were prompt and perfect, except in the first case of Morris, who informs me that a sinus still persists, five years subsequently.

When the symptoms point to a renal calculus, the surgeon should make an exploratory operation through the loin, with a view to its detection and removal without a resort to nephrectomy. Of 23 exploratory operations, of which 3 were done by Beck, 2 each by Morris, Lucas, and Annandale, and 1 each by Gunn, Durham, Lente, Golding-Bird, Barker, Barbour, Norton, Anderson, Fowler, Powell, Thornton, Hulke, Bardenheuer, and Lawson, all recovered, the kidney having been actually incised in four. Although a stone was not detected, the procedure was absolutely free from danger, but a calculus was doubtless present in some of the cases, even though it was not found by the fingers and acupuncture. Hence, we may conclude, with Morris, that in calculus of an otherwise healthy kidney, the organ should be incised after the failure of the ordinary methods of exploration, and thoroughly examined with the finger, before it is condemned to removal.

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[1] The operators were Thornton in 3 cases; Morris and Beck, each in 2 cases; and Butlin, Bardenheuer, May, Howse, Hill, Symonds, Anderson, Godlee, Elder, Cullingworth, Pepper, Chiene, Rouse, and Tiffany, each in 1 case.

9. *Ureteral Fistulæ.*—For urinary fistulæ communicating with the exterior of the abdomen, the vagina, or the uterus, and due to wounds or injury of the ureter in ovariotomy and hysterectomy, to the use of the forceps in labor, and in one instance to a suicidal attempt, the kidney has been removed 12 times,[1] with 9 recoveries, and 3 deaths, or a mortality of 21.27 per cent. The cause of death was collapse in 2, and uræmia from disease of the opposite kidney in 1. Of the 11 lumbar operations, 3, or 27.27 per cent. succumbed, while the single abdominal operation recovered.

Although it seems a pity to remove a functionally active organ, yet the constant escape of urine in this class of cases is a source of so much discomfort and disgust that it is the only resource. The lumbar incision is, of course, the preferable one.

10. *Injury to the Ureter and Kidney.*—During the removal of a retroperitoneal cystic tumor by laparotomy, Thornton wounded the ureter, and at once extirpated the kidney with success. Bardenheuer met with the same accident during hysterectomy for carcinoma, and removed the kidney through the loin, but the patient died of collapse. Archer lacerated the kidney during ovariotomy, and extirpated it successfully on account of hemorrhage. In an example of rupture of the ureter with the formation of a urinary abscess in a child forty-four months of age, Barker removed the kidney through the loin, and the patient recovered. He informs me, however, that at the end of four months the child was dying from general tuberculosis. In these four cases the kidney was perfectly normal, and as its removal was complicated in three by simultaneous severe operations, the slight mortality is simply wonderful. In a fifth case, Rawdon extirpated the kidney through the loin, on account of subcutaneous laceration, and the patient expired on the fortieth day from suppuration of the opposite kidney. In three examples of protrusion of the kidney through a wound in the loin, in two of which it had been incised, Brandt, Marvaud, and Hamilton successfully removed the organ.

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[1] The operators were Albert, Billroth, Boeckel, Credé, Czerny, Le Fort, Novaro, Simon, Starck of Dantzic, Starck of London, Thornton, and Zweifel.

Agnew refers to a case in which, after the accidental division of the ureter in ovariotomy, the renal end was secured in the abdominal wound, and a urinary fistula established. The patient died, at the expiration of several months, of severe obstruction of the duct. In removing the uterus for carcinoma, Henry Morris excised half an inch of the ureter, and fixed its renal extremity in the vagina. The formation of a urinary fistula was, however, prevented by the death of the patient.

While Agnew and Morris recommend the establishment of a urinary fistula when the ureter is wounded in removing an abdominal tumor, we consider their proposal as being one of very questionable value, unless, after the formation of the fistula, nephrectomy be performed to rid the patient of a source of great discomfort and annoyance. The fixing of the renal end of the ureter in a wound made in the loin, would certainly lessen the risks of death from shock, which occurred once in the two cases of combined laparotomy for abdominal tumors and nephrectomy. Hence, in this class of injuries, we believe that nephrectomy should not be performed as a primary operation.

Should the kidney be badly lacerated during the removal of abdominal tumors, and the hemorrhage be troublesome, the organ will have to be removed, as was done by Archer. Subcutaneous rupture of the ureter, followed by the formation of a urinary abscess, demands extirpation of the kidney; but we require more experience to determine the proper course to pursue in subcutaneous laceration of the kidney. Nephrotomy and drainage should probably be tried before the kidney is excised. When the kidney protrudes through a wound in the loin, provided it can be returned, and it is not materially injured, primary nephrectomy should not be performed.

11. *Unclassified Lesions.*—With a view to completing the statistics of nephrectomy, it may be stated that three lumbar operations have been performed by Durham, Bardenheuer, and Langenbuch, of which two recovered. In the case of Durham, which proved fatal from pyæmia, the kidney was painful, but healthy. Bardenheuer's case was supposed to be one of calculus, the patient having suffered from renal colic and hæmaturia; while in that of Langenbuch, performed for supposed sarcoma, the kidney was converted into a sac, and was accidentally thrown away before its true nature could be determined. In two additional operations, done through the belly, Billroth and Sir Spencer Wells removed a sound kidney attached to a uterine growth. Both patients died.

From a careful analysis of all the facts pertaining to the surgery of the kidney contained in this paper, based as it is upon a study of nearly four hundred and fifty cases of different operations, I believe that I am justified in formulating the following propositions for discussion:—

1. That lumbar nephrectomy is a safer operation than abdominal nephrectomy.

2. That primary extirpation of the kidney is indicated, first, in sarcoma of adult subjects; secondly, in benign neoplasms at any age; thirdly, in the early stage of tubercular disease; fourthly, in rupture of the ureter; and, lastly, in ureteral fistula.

3. That nephrectomy should not be resorted to until after the failure of other measures, first, in subcutaneous laceration of the kidney; secondly, in protrusion of the kidney through a wound in the loin; thirdly, in recent wounds of the kidney or of the ureter, inflicted in the performance of ovariotomy, hysterectomy, or other operations; fourthly, in suppurative lesions; fifthly, in hydronephrosis and cysts; sixthly, in calculus of an otherwise healthy kidney; and, finally, in painful floating kidney.

4. That nephrectomy is absolutely contraindicated, first, in sarcoma of children; secondly, in carcinoma at any age, unless, perhaps, the disease can be diagnosticated and removed at an early stage; and, thirdly, in the advanced period of tubercular disease.

ARTICLE IV.

REPORT OF NINE CASES (SECOND SERIES) OF PLEURITIC EFFUSION; WITH REMOVAL OF NINE HUNDRED AND SIX OUNCES OF FLUID. ALSO ONE OF PARACENTESIS IN ABSCESS OF THE LIVER;—A PINT AND A HALF OF PUS EVACUATED, WITH RECOVERY.

By F. PEYRE PORCHER, M.D., Professor in the Medical College of the State of South Carolina, and one of the Physicians to the City Hospital, Charleston.

OUR principal object in recording this new series of cases of paracentesis for pleuritic effusion (the others having been reported in *The Medical News* for Dec. 22, 1883) is that they will force upon us the conviction that this diseased condition is extremely frequent, and that often it is not recognized and remedied. Upon taking charge of the wards under our care in the hospital, which contain not more than sixty to eighty beds, we encounter during our last term of service of less than four months seven cases of pleuritic effusion; and detect the presence of hydrothorax by the autopsy in seven others not operated upon, besides leaving four additional cases under treatment. Most strange and singular fortune that it should happen to us in the ensuing four months to discover four more also, in private practice, and remove from two of these an additional two hundred and sixty-nine ounces. In the third case there was an offensive purulent accumulation in the pleural sac, which finally broke into the right lung causing gangrene of that organ; but surgical interference offered in time for its relief, was refused.

Such an irruption of cases (twenty-two), occurring in the practice of a single individual (and, with three exceptions, we have heard of no others at the meetings of the Medical Society and Medical Association of South Carolina), can hardly be ascribed to fortuitousness, a fatality, or a mere coincidence! Many of these people were walking about seemingly in comparative comfort, and, with the exception of dyspnœa, or some unimportant sign of disease, giving scarcely any outward or superficial manifestation of the presence of intra-thoracic accumulations, which might—besides materially increasing their sufferings—go on to imperil or destroy their lives.

The present exhibit added to our first series, fully warrants us, therefore, in urging unusual care and watchfulness in *searching* for the presence of pleuritic or pericardial effusion, whenever dyspnœa and oppression exist; and even when absent, for they are not essential symptoms. To discover the existence of fluid in the thoracic cavity is a comparatively coarse procedure; and though it may presuppose some experience and practice, does not call for the exercise of any special refinement in auscultation and percussion: whereas to detect pericardial effusion is far more difficult, and requires exceeding nicety and skill in diagnosis.

It is not our province to enter here a special plea for such operations. It requires no great draught upon the imaginative faculties to conceive the relief afforded in such cases by early, judicious, and when necessary, repeated tappings. How salutary must be the removal of pints or quarts of serous or sero-fibrinous effusions by the formation of which the blood had been robbed of its most important elements, which had been compressing the lungs; displacing and disturbing the heart, impairing the power of absorption and the normal functions of the organs in every region of the body; or which, passing by diapedesis into neighboring structures, as the pericardial sac or even into the abdominal cavity, were mining the foundations, as it were, of the very citadels of life.

The following cases of paracentesis thoracis occurred in the medical wards of the City Hospital, from July 1 to Oct. 1, 1884, and to Dr. W. D. Bratton, House-Physician, I am indebted for the notes.

CASE I.—Wm. McP., æt. 70, admitted July 3d. History and symptoms of chronic pleurisy. Hypodermic needle showed presence of fluid in right pleura, confirming other diagnostic signs.

July 5. One quart was evacuated with aspirator.

15*th*. Two quarts more were drawn from same pleura. Diuretic of tinct. squill, etc., iodine externally, tonic treatment, etc., completed the cure. Discharged August 6.

CASE II.—Jane H., æt. 30 years, admitted July 10. Cardiac hypertrophy, degeneration and failure, with consequent hydrothorax and hydro-pericardium. Effusion greatest in right pleura, and thoracentesis called for by urgent dyspnœa.

July 17. Aspirated right pleura, drawing forty-eight ounces, without entirely exhausting the sac of fluid. Re-accumulation promptly took place: but general anasarca, and her condition otherwise, made a repetition of the operation inadvisable, as useless. Died on 26th.

CASE III.—Calvin J., æt. 40, admitted July 15. A case of atrophic kidney probably, followed by hypertrophied left ventricle and mitral failure. In spite of treatment, the serous effusion in both pleuræ which resulted called for operation on August 15, and about two quarts were drawn from right pleura, which seemed rather the fuller of the two. Deemed inadvisable to interfere with the other just then. At date (Sept. 30) doing very well under general treatment.

CASE IV.—Jeffrey G., æt. 40, admitted July 17. This is probably a case of mitral regurgitation following great hypertrophy consequent upon chronic Bright's disease. Indeed, the mitral failure has become apparent only since admission. The patient was of scrofulous, perhaps syphilitic, taint, and there had probably been an old pleurisy on right side. At least, I can only attribute the much greater serous effusion which occurred, without rise of temperature, etc., on right side than on left, to some such change in the right pleural sac. Dyspnœa, etc., demanded operation.

July 23. Sixty-seven ounces were drawn from right pleura, and patient put on appropriate treatment. Nevertheless, the same symptoms called for a repetition of the tapping on Aug. 10, when sixty-one ounces were drawn, and on Sept. 17, when seventy ounces were aspirated.

Sept. 29. Dyspnœa, cough, failure of heart, etc., called for aspiration again—right pleura having once more swelled. Drew eighty-four ounces, and strapped that side.

As to quantity of fluid, and frequency of operation, the following will give a compact view:—

Case 1. Right pleural cavity, 32 ounces; right pleural cavity, 64 ounces.

Case 2. Right pleural cavity, 48 ounces.

Case 3. Right pleural cavity, 64 ounces.

Case 4. Right pleural cavity, 67 ounces; right pleural cavity, 61 ounces; right pleural cavity, 70 ounces; right pleural cavity, 84 ounces.

Punctured almost invariably between sixth and seventh ribs—mid-axillary line.

It is somewhat surprising, that in every case, without exception, the right pleura should have been found involved either alone, or chiefly.

While these were all the cases operated on for removal of pleural fluid, there were two cases, those of Isaac R., and Robert G., in which an attempt was made, ineffectually, owing to state of instruments used, to evacuate pleural effusion. Both died, and effusion of considerable extent was found in the right sac in the case of R.; and excessive accumulation in both sacs, in the case of G. Hydro-pericardium was found in both—not enough to cause death independently of hydrothorax.

Besides, there were the cases of Marcus N., Amy S., Eve W., and A. B. All these suffered from ascites, and were tapped for its relief—Amy S. several times; in all hydrothorax was either made out, or confidently predicated, œdema of chest walls, in all but B. preventing absolute demonstration. Operation was useless, and all died. In each and every one both pleural sacs were distended with effusion.

Then, in case of Dober McN., who died before relief could be afforded, fluid was diagnosed in right pleura, and one and one-half pints found there after death.

As no record was kept of every case, some have no doubt escaped me: at present there are in the ward at least four cases of abnormal collection of fluid in pleura.

Case V.—Louis V. N., æt. 55, white male; admitted June 13th, with great distension of abdomen and chest, with swelling of legs and arms. After careful examination no organic disease could be found. Heart-sounds not clear, but no lesion could be positively made out; urine normal; liver somewhat enlarged. Diagnosis: chronic malarial poison reducing tone of vessels. At 10 P. M., dyspnœa so great patient was tapped by house physician, and about two gallons of fluid drawn from abdomen.

Fluid being found in pleural cavity of right side on July 4th, patient was aspirated between seventh and eighth ribs near angle, and f℥xxxvi drawn off; great relief experienced. Patient put on a tonic diuretic mixture, and improved steadily. Discharged August 1st, well. No return of fluid up to this date.

Case VI.—M. F. McB., æt. 36, white male; hard drinker, digestion poor, stomach irritable, general condition poor, much emaciation. Patient had been exposed to a damp, cold, and sunless jail. Has cough and pain in side, with considerable dyspnœa. Diagnosis: general debility with chronic pleurisy; there being considerable effusion detected on right side, patient was aspirated on July 24th between sixth and seventh ribs, below the angle of the scapula, and f℥xxxvi removed. Great relief experienced. At date, Oct. 10th, fluid seems to have re-accumulated to some extent.

Case VII.—Mrs. K., æt. 70, white, female; admitted July 21, 1884. Patient's legs œdematous, little or no fluid in abdomen; urine about normal; heart weak, intermittent, and irregular. Patient "took cold" several years ago going into a damp cellar; she has great dyspnœa, and is pretty weak; dulness over greater part of right side. Fluid being found by hypodermic needle, patient was aspirated on August 5th between sixth and seventh ribs, three inches below the angle of the scapula, and f℥xxvii removed; great relief experienced. Patient put on tonic diuretic; swelling of legs much reduced. At date, fluid has re-accumulated to some extent.

[Above three cases, July 1 to October 10, 1884, reported by Dr. Mazyck P. Ravenel, House Physician.]

Case VIII.—Was consulted, by letter, by a lady, Mrs. P., æt. 55, residing at a distance from this city, who complained greatly of dyspnœa, fainting attacks, and great oppression with inability to sleep. Suspecting pleuritic effusion as a probable cause, we visited her taking the precaution to provide an aspirator, to which Fitch's Dome trocars were attached.

Upon examination, it was found that grave disease of the heart coexisted with effusion; and a few minutes after arrival forty-eight ounces of sero-sanguinolent fluid were removed from the right cavity of the thorax.

The suffering and oppression had been extreme, at intervals, for many weeks before our visit (which prevented her from coming to the city), and though partially relieved, she survived but a few days.

Case IX.—In attendance upon Mr. G., æt. 40, who was suffering from difficulty of breathing and great oppression, especially at night. He declared that he was perfectly well three months previously, *i. e.*, in February last; but had been exposed to draughts of air while at work in a large store, and undoubtedly he had had a latent and undetected pleurisy. He had no fever at any time after we saw him; his urine was highly albuminous (three-fourths of test-tube); insufficiency of the aortic and stenosis of the mitral valves existed, with some dropsy of the lower extremities; mind, as usual in all such cases, perfectly clear.

After careful examination and the preliminary insertion of the hypodermic needle, ninety-two ounces of serum, slightly stained with blood, were removed (April 25, 1885) with the aspirator from the right cavity of the chest. Dr. J. M. Caldwell and my son, Dr. W. P. Porcher, were present.

The needle was entered three inches below the lower border of the scapula. We find it to be an indifferent matter whether the puncture be made here, or at the middle axillary space, at a point intermediate between these two, or even in front below, and to the outside of the nipple; the main indication is to select the centre of the area of dulness; and, for obvious reasons, avoid penetrating too high or too low.

An attack of cough warned us to desist. Great relief from the desperate attacks of dyspnœa followed. In ten days, however (May 5th), we discovered that the fluid had re-accumulated, notwithstanding that blisters and iodide of potash, with diuretics, had all along been employed, and ninety-five ounces of a similar fluid were evacuated.

Again his life is measurably prolonged; the fluid is re-accumulating for the third time; I fear that two more quarts can be aspirated, but the patient is anxious for a repetition of the operation, on account of the great relief it necessarily affords.

[May 17, removed eighty-two ounces.]

But where disease of the heart coexists, far greater gravity is imparted, and this patient has three organic diseases to contend with, namely, of the pleura, the heart, and the kidneys.

Cases such as this—equally with anasarca where the entire body, "pallid and languid," saturated and sodden by serum—recall to us the pathology of Horace (Carm. Lib. ii. 2):—

> Crescit indulgens sibi dirus hydrops,
> Nec sitim pellit, nisi causa morbi,
> Fugerit venis, et aquosus albo
> Corpore languor.

With the direfully irremediable nature of which the ancients—who probably had no aspirators—were as much impressed as we are. (See also Ovid, Fast. I. 211.[1])

Abscess of Liver.—One pint and a half (24 *ounces*) *of pus removed; with recovery.* (Reported by Dr. Alford, House Physician.)—Patrick J., age 37. Patient presented himself for treatment in the medical ward of the hospital, September 11, 1884; is a native of Camden, South Carolina, from whence he removed to Charleston ten years ago, where he has resided ever since, except the past three years spent in Savannah, Georgia, in a malarial portion of the city, and he became subject to "chills and fever."

A pain over the region of the liver began about the first of July last, and has been continuous, but not severe, and with no history of injury connected with it. Two weeks previous to his admission it became more acute, and within the past week he has had several chills and vomited once or twice.

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[1] We are inclined, however, to think that both of the classic authors referred to, had in mind the inappeasable thirst and the polyuria of diabetic dropsy.

Present Condition.—Somewhat reduced in flesh; loss of appetite; having a disgust for all kinds of food; motions from the bowels are regular once a day; sometimes twice; stools are straw-colored and pasty; breathing hurried and shallow; deep inspirations or sudden movements of the body elicits pain; tenderness is experienced on pressure in the region of the umbilicus and hypochondrium; the area of hepatic dulness is increased in all directions—notably below the false ribs, where there is also considerable tension and swelling; the point most noticeable is on a level with umbilicus about four inches to right and in a line with nipple; fluctuation is distinct and a hypodermic needle was introduced and pus withdrawn. The attending physician (Dr. Porcher) was sent for, and abscess of liver diagnosed. He decided to puncture it immediately with a large size trocar at the location mentioned above, where swelling was most marked, and a pint and a half of pus of a yellowish color, becoming bloody towards the last, escaped. A drainage tube was passed through the canula, and the latter removed, leaving the former in place; pus continued to discharge. (Operation after the method of Dr. Patrick Manson, of the Chinese Maritime Service.) Had a chill the next day, and his temperature rose to 105.2°; nauseated and vomited two or three times. ℞. Quinine and iron given three times a day.

Sept. 15. Temperature has reached 105°, every evening since the operation; drainage tube removed; opening discharging continuously.

16*th.* Temperature did not rise higher than 102° to-day; is more comfortable, and has more relish for food, but has diarrhœa.

Dec. 16. Temperature normal; appetite is better; regained some flesh and the area of liver dulness markedly diminished; though pus continues to drain away. Has been taking quinine, sulphide calcium, Fellow's syrup of the hypophosphites, and sherry wine.

March 1, 1885. His general condition is much improved; the discharge from fistulous opening is small in amount and thin and serous in looks; appetite very good; bowels regular and stools more of a natural color. Patient is still under treatment in the hospital.

April 20. Has been discharged from hospital, and can walk two miles without inconvenience.

May 12. No signs of his former disease.

ARTICLE V.

A CASE OF CHOLECYSTOTOMY. By CHARLES T. PARKES, M.D., Professor of Anatomy in Rush Medical College, Chicago.[1]

THE rather recent revival of operative procedures for the relief of obstruction of the biliary ducts, has awakened a new and lively interest in all such cases; especially as the entire number of reported operations falls within a total of fifty.

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[1] Read before the American Surgical Association, April 24, 1885.

Of this series, submitted to operations, by far the larger portion have been cases of cholecystotomy, by means of which a distended gall-bladder has been positively relieved, and in most of them the cause of obstruction, retained gall-stones, removed. In a few no gall-stones were found, while in others the cause of the obstruction could not be remedied.

The excellent and exhaustive paper, based upon four cases, presented to the profession by Drs. Keen and Musser,[1] of Philadelphia, portrays the operation of cholecystotomy, with all its vicissitudes and requirements, together with the symptomatology of duct obstruction so completely and lucidly, that there seems but little more to be said in addition to relating the history of a patient with gall-stones, who has been under my care during the past winter, and who was relieved by operation from their presence and the long-continued distress incidental thereto. Every one of these cases has some special circumstance of interest connected with it, and trustworthy conclusions only become possible after a consideration of all the facts culled from a large number of operations.

CASE.—Mrs. K. B., aged 29 years, married; born in America, and residing in Chicago, came under my charge December 10, 1884. She had been made quite an invalid by years of suffering, and when first seen by me had just passed through a two days' siege of great agony.

She related a history of more than two years' duration of suffering from paroxysmal pain, referred to the right hypochondriac and epigastric regions, and radiating beneath the right shoulder. These paroxysms were seemingly unattended with much or any febrile disturbance; were sometimes accompanied with constipation, and generally with loss of appetite. Quite often with them came nausea and vomiting. No biliary matter was ever vomited, and the feces were at all times light gray in color.

The attacks were of uncertain duration and somewhat uncertain frequency, but seldom remained absent longer than two weeks; so that the patient never had time to recover from the effects of one attack before she was prostrated by the recurrence of another.

One year ago a gall-stone as large as a coffee bean came away by the bowel; no others were found previous to or since that time, though often sought after. No amelioration of any of her symptoms followed its extrusion.

The patient had been under the care of worthy physicians all this time; they all diagnosticated the cause of the trouble to be the existence of gall-stones, and had subjected the patient to every known remedial medicine, without relief other than that coming from the use of large doses of opium, and with these the patient's agony was intense during the acme of the paroxysm. Among the agents used were chloroform, ether, olive oil in large doses, and many other "cures," the best results following the administration of morphia.

Examination revealed the following facts: The patient is quite well nourished, flesh firm and in good quantity. The skin is slightly, yet noticeably, jaundiced all over the body. There is no complaint of itching. Complexion rather pale and sallow, facial expression indicative of suffering and dread. Tongue clean and red. Examination of the thorax reveals nothing abnormal in the condition of its contents.

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[1] THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, October, 1884.

On inspection, the abdomen shows a clearly defined bulging of the right hypochondrium, extending into the epigastrium. Percussion defines liver dulness extending downwards fully three inches below the edges of the costal cartilages, also to the left some distance; again the dulness reaches to a higher point into the thorax than is normal. Palpation gives evidence of a resistant mass, smooth, well marked, and slightly tender, evidently an enlarged liver. Careful circumscribed percussion seemed to establish the existence of a separate point of dulness, about the size of a silver dollar, near the centre of the edge of the liver dulness, and in a line with the tip of the tenth costal cartilage. This had resonance surrounding it on all sides except above. It was somewhat elastic to the touch, and was supposed to be the fundus of the distended gall-bladder. No calculi could be certainly diagnosed as present by any external manipulation; subsequent results showed they would have eluded acupuncture, which was not practised. The feces are still light-colored, both during and after the paroxysmal attacks of pain. There is no ascites or tympany, neither is there the slightest evidence of œdema of the lower extremities.

Chemical analysis of the urine fails to reveal any evidence of albumen or other abnormal condition; although chocolate-colored, there was only very slight reaction showing the presence of bile. The microscope gave no testimony in favor of degenerative changes in the kidney.

The prolonged existence of pain, referred to the one place, with absence of any evidence of other trouble, either benign or malignant, confirmed the diagnosis already made of obstruction of the gall-ducts. Mrs. B. was told that probably no medical treatment would give her relief; that she had been faithfully and properly treated by her previous attendants; and that nothing could be added to what they had already done with medicines; but that there remained for trial the operation of opening the gall-bladder. After an explanation thereof, she immediately gave consent to have the operation performed. With that intent she entered the Presbyterian Hospital of Chicago, December 15, 1884. On December 17th, a public consultation was held with Profs. Gunn, Ross, Estheridge, and Bridge, and Dr. Whitney, all of whom concurred in the diagnosis and the probable relief from operation.

After preparation in accordance with the principles of strict antisepsis in the clinical amphitheatre of Rush Medical College before the past winter's class and with the assistance of Prof. Moses Gunn and Dr. E. P. Davis, the following operation was done. An oblique incision five inches long was made over the tumor, parallel to and about two inches away from the edge of the costal cartilages. The walls of the abdomen were slowly divided, until the peritoneum was exposed throughout the length of the wound, all bleeding points were occluded, with the snap forceps or ligature, before opening the peritoneum. When this was finally done, there was exposed to view only the smooth, even surface of the enlarged liver. The lower edge of this organ was fully two inches below the line of the wound. Nothing could be seen of the gall-bladder.

By passing two fingers into the wound and beyond the liver the distended gall-bladder, round and tense, was readily felt. The finger was slowly and carefully carried around it, and by this means slight adhesions between it and the surrounding organs were broken down. Then the enlarged liver was forced up beneath the ribs by pressing upon its lower surface, and in this way the gall-bladder was brought into the abdominal opening. Considerable difficulty was experienced in retaining it at the opening, for every inspiration made by the patient forced the liver downwards, and carried the gall-bladder with it. Prof. Gunn overcame this difficulty by placing his fingers on the under surface of the organ and forcibly holding it up beneath the ribs. Two small sponges, with tapes attached, were placed to the right and left of the bladder to isolate it as much as possible and at the same time to absorb any waste that might fall into the abdominal cavity.

The walls of the gall-bladder were very thin, and the clear fluid which it contained could almost be distinguished through them. An aspirator needle of medium size was thrust into the centre of the fundus with the intention of withdrawing the contained fluid by aspiration. After its introduction some movement of myself or the patient accidentally displaced the needle, and immediately there followed a free flow of viscid mucus, slightly tinged with biliary matter. This was prevented from entering the abdominal cavity by drawing the bladder closely against the lower corner of the wound; a slight puncture with the knife was followed by an outflow of three or four ounces of fluid; none entered the peritoneal cavity. As soon as the viscus was empty its walls were seized by two snap forceps about an inch apart, and the opening in the bladder enlarged to that length. Gall-stones were then sought for, first by a probe, then with a pair of forceps, and finally with the finger.

The cavity of the bladder was thoroughly explored with all three, but no bodies of any kind were found in it. The edges of the wound in the gall-bladder bled quite freely, and were compressed here and there with forceps. The difficulties attending the great enlargement of the liver prevented as critical an examination of the common duct as one would like; still, attempts were made to follow its course, but without success. No gall-stones were found, nor any other source of obstruction. The wound was closed in the following manner: stitches were first introduced through the edges of the abdominal wound on the right and left of the point selected for the attachment of the gall-bladder in the establishment of a fistula. Then the opening in the gall-bladder was fastened to the edges of the central portion of the external wound by means of five sutures, first passed through all the tissues of the abdominal walls, and then through all the coats of the viscus; so that broad peritoneal surfaces were brought in contact throughout the entire circumference of the bladder wound. Great care was given to the security of these sutures, from the fear that the dragging of the heavy liver might displace them. A large perforated rubber drainage-tube was carried to the bottom of the gall-bladder, and the sutures all fastened after thoroughly cleansing all portions of the peritoneal cavity in the vicinity of the wound. Iodoform was dusted on to the wound freely, and it was covered with an extensive and thick dressing of dry sublimated gauze. Outside of this was placed a mass of borated cotton, and over all the usual bandage.

The patient showed signs of considerable shock; was given a hypodermic injection of whiskey. There had been no attempts at vomiting. The patient was put to bed, head low, and hot water bottles to feet. Reaction came on fairly well, and on becoming conscious she complained of severe pain at the site of the operation, was fed with cracked ice and given morphia hypodermically.

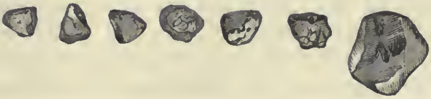
At 10 P. M. the pulse numbered 84. Temp. was $98\frac{1}{5}$°, and the skin was moist and cool. Complains of pain in wound at intervals; has some nausea, but has not vomited. Passed a comfortable night, and was free from nausea. The patient was now bolstered up into a half-sitting posture in order to relieve, as far as possible, tension on the gall-bladder.

After complete recovery from the effects of the anæsthetic the patient was quite comfortable, and until the wound healed the highest point reached in temperature was 99½°. For a few days alimentation was mainly carried out by rectal injections; keeping the stomach quiet aided in preventing vomiting; had this occurred the attachments of the cyst would have been greatly endangered. Aside from nervousness the patient was free from any inconvenience. The urine was dark in color and normal in amount. The bowels were moved on the third day by enema.

The wound was not disturbed at all, merely additional dressings of dry cotton placed over that already on, for the purpose of absorbing a very profuse flow of greenish fluid which showed itself on the second day, and rapidly saturated everything about the patient. On the fourth day, December 24th, owing to the profuseness of this discharge, a change of dressing became imperative. The wound was found glued together throughout its entire length, except at the site of fistula. No tenderness or swelling indicative of any inflammatory condition was present. The enlarged liver had entirely disappeared, and percussion placed it within the normal boundaries. The line of the wound, instead of being flush with the surface of the chest, was drawn under and beneath the costal cartilages. The free flow of greenish fluid had evidently entirely relieved the engorged hepatic ducts. .Some of the stitches in the abdominal wound were removed. The drainage-tube was taken out and the cavity of the gall-bladder probed, deep in its cavity some foreign body was felt, and two of the smaller stones here shown were removed by the forceps; no others were felt. The drainage-tube was replaced, and the same dressings as first used reapplied.

On the 7th day, December 26, redressing was again required, on account of the free discharge of similar greenish fluid, so abundant that it saturated the bedding as well as dressing. All sutures removed; wound entirely healed. Probing of the cyst cavity again discovered foreign bodies, and with the forceps five more gall-stones were removed. The last, the largest, here shown, was seized with much difficulty, and seemed to be embraced by mucous membrane (Fig. 1). No more stones were found at any time. (The total weight of the seven stones removed is 7.22 grs.)

Fig. 1.



The patient improved rapidly in general health; all the functions are performed normally; the jaundice has entirely disappeared; she is free from all pain and in bright spirits; and up and about the room. At the end of two weeks the patient could, apparently, have safely left the hospital, had she lived away from the city, and could have gone to her home completely cured. The probe when introduced into the fistula seemed to come in contact with a roughened surface. The stools were still light-colored, unstained with bile. Every day or two a profuse flow of muco-biliary fluid came from the fistula, which the patient again said was accompanied with severe pain. The amount of pain was undoubtedly exaggerated, as the pain was not complained of until the discharge made its appearance outside of the dressing, and was on several occasions overcome by hypodermic injection of water.

Still all these occurrences seemed to point to continued occlusion of the common duct from some cause. Half a pint of sweet oil was administered with the hope of overcoming the obstruction. No stone was found in the subsequent dejections, but there came away six round, firm, white bodies about the size of a bean, which were at first supposed to be concretions of cholesterine; examination showed them to be merely inspissated mucus and free oil. Perhaps such are the only bodies recovered after using sweet oil as a remedy for this trouble.

After failure to obtain relief with remedies, it was determined again to perform laparotomy to confirm a diagnosis of partial occlusion from stenosis or an impacted stone, close to the intestines, in the common duct. On January 18th, with the assistance of Drs. R. Filley, E. P. Davis, and L. H. French, vertical incision, four inches in length, commencing at the fistula, was carried through the abdominal wall. The deepest part of the dissection was made with great care, in anticipation of meeting with adhesions between the abdominal walls and intestines. These adhesions were not entirely avoided; near the gall-bladder, at the highest point of the incision, the wall of the duodenum was partially torn through, and troublesome bleeding came from the tear, which was finally controlled by sponge pressure. The loose intestinal folds gave no trouble, and were easily held out of the way, so that the entire course of the duct from the gall-bladder to the duodenum could be readily and clearly traced with the finger. It felt like a dense hard cord. The bladder was entirely empty. No calculus could be found in any portion of the duct. Bougies of different sizes were passed through the fistula, and, guided by the finger, an attempt was made to pass them into the duct; no success was met with. Then a steel sound, No. 11, was passed through the fistula, and again guided by the finger in the peritoneal cavity, after some manipulation, was finally carried into and through the common duct into the cavity of the intestine. No calculus was felt, and no other special obstacle to its passage was recognized. The abdominal wound was thoroughly closed with sutures in the usual manner. No drainage employed. Antiseptic gauze used for dressing.

The patient rallied well from the operation, but free vomiting soon showed itself, and the ejecta were mainly bile. This vomiting of bilious fluid continued during the first twenty-four hours after the operation, and there was no discharge from the old fistula. An enema brought a freer discharge of bile from the rectum, the first to show itself since the trouble began, quite two years ago. All these facts proved that the passage of the sound had restored the patency of the biliary ducts. Some discharge soon came through the fistula, mostly mucus, but bile-stained. The dejections were carefully examined while the patient remained in the hospital, but no gall-stones were discovered. Convalescence was without interruption, appetite returned, and pain was entirely relieved. The sutures were removed on the seventh day, and the wound found completely united by first intention. The patient was discharged well with the fistula rapidly healing on February 1st, 1885.

On April 1st, two months after leaving the hospital, Mrs. B. sent for me again, suffering severe pain in her side. I found that the fistula had been entirely healed for two weeks, and that she had been absolutely free from pain during the previous two months. The day before she had been out all day exposed to the inclemency of very bad weather, and the result was that she had a severe bronchitis and a return of the old pain.

The site of the wound was tender to the touch, and I re-opened the fistula with a tenotomy knife, giving exit to quite a quantity of bile-stained mucus, which continued to flow during the next day. The pain was entirely relieved by this procedure. A small drainage-tube was re-introduced, and is to be kept in place with the intention of keeping the fistula open for some time.

Bile has not ceased to be discharged through the natural channel at any time since the last operation. Still, evidently, the calibre of the common duct is not sufficiently large to carry off any increased flow of biliary secretion.

The patient has improved greatly in general health, has gained flesh, and has a bright clear complexion, and has resumed all her household duties.

Some suggestions follow as an outgrowth of this case which are of practical importance and application.

It is quite certain that the gall-stones in this case were not lodged in the gall-bladder, and could not have been overlooked at the time of the operation. It is highly probable that they were retained in some of the dilated hepatic ducts, and were washed into the cyst by the flow of biliary fluid which came on immediately after the formation of the fistula. I am inclined to believe that they had but little to do with preventing the flow of bile into the intestine: at least the patulency of the passages was not restored by their removal.

The remarkable and profuse flow of muco-biliary fluid, coming through the sinus established, argues very strongly in favor of the operation which contemplates the formation of a fistula in the gall-bladder in distension thereof by confined secretions. Certainly I think no tube of the dimensions of the ductus communis choledochus could have given a free exit; at least the accompanying back pressure on the walls of the cyst would have greatly endangered, if not certainly destroyed, the adhesions in any recent wound thereof, even when protected by the continued suture. Most of the cases of reported cholecystotomy which I have been able to consult tell of the presence of a freer flow through the fistula, so that it is a condition to be expected, and it makes immediate closure of the bladder wound without drainage a dangerous proceeding to adopt, even if we can be positively sure of a clear common duct.

In a recent letter from Mr. W. T. Meredith, of London, in reply to some inquiries about his case of cholecystotomy, Mr. M. says his case has been given in the later tables as a fatal one, but that he has not given as yet a complete report of it. A large amount of biliary matter was formed in the gall-bladder. It was tapped with the trocar, and then freely opened. Three large stones were found and removed, and as the common duct seemed entirely patulous, the opening in the bladder was carefully closed, no drainage adopted, and the external wound closed. The operation was done under the spray. The patient died inside of forty-eight hours with suppression of urine. On *post-mortem* examination the gall-bladder contained half a pint of bile, and considerable quantities (several ounces) were found in the folds of the mesentery; some bile had also gotten into the duodenum. The gall-bladder incision seemed entirely closed, none of the fluid coming out on squeezing the cyst. The kidneys were found diseased, and their condition evidently mainly led to the fatal issue.

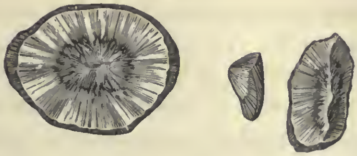
Still Mr. Meredith says: "As regards the dispensing with all drainage, I am not disposed to repeat the procedure above described, although I do not see why it should not succeed in a favorable case, provided always that it is possible to ascertain with certainty that the ducts are left quite free. This, of course, constitutes the weak point in the matter; and on the whole, therefore, I think the usual plan of drainage and suturing to the abdominal wall should be performed."

This is the only case of immediate closure that I have any account of in which the report is at all full. I am disposed to go further than Mr. Meredith by expressing my conviction that the back pressure of accumulated secretions following a long period of occlusion must have an additional safety valve, and that the safety of the patient demands the establishment of a fistula when possible.

Naturally follows the question of whether it is always possible to establish a fistula in cases of gall-stone obstruction? Within a week of the time of doing the operation above reported, this question was practically answered by a *post-mortem* examination on the body of a lady who had suffered for some years with all the symptoms of gall-stones. The examination revealed the gall-bladder shrivelled to the size of the thumb, and the common duct distended and containing six gall-stones of the size of the two now shown to you, which are of the six found in this case. In this case the bladder could not have been brought in contact with the abdominal walls, as the patient was not thin, and the intestines over-full and of large calibre. It is quite certain an operation in this case would have presented many difficulties. Here incision of the duct, removal of the stones, and immediate closure by means of the intestinal stitch would have been, perhaps, the only operation to do. In such a case, to me the best practice would seem to require the insertion of a drainage-tube to the site of the duct wound, and the bringing of it out of the abdominal opening, in order to provide for external exit, should any leakage occur.

Nature's methods of freeing the bladder and ducts from their foreign bodies are unique, interesting, and sometimes dangerous. Here, for instance, are shown to you several gall-stones which produced death by ulcerating their way into the stomach through the walls of the pylorus, and were found in the stomach *post-mortem*. The case was in charge of

Fig. 2.



Dr. C. T. Fenn, of Chicago, Illinois. (Fig. 2.) Through the courtesy of Professor Hosmer A. Johnson, of Chicago, I am enabled to show this valuable specimen. It displays a very large gall-stone in the lumen of the small intestine. It was removed *post-mortem*, and caused the patient's death from obstruction of the bowel. The patient suffered from the ordinary symptoms of bowel obstruction, and died with all the signs thereof present. The autopsy not only gave this specimen, but showed as well the large opening made by ulceration between the gall-bladder and duodenum, through which it passed into the bowel. A full account of the paper, with valuable suggestions as to procedure in relieving the obstruction had laparotomy been done, was published by Professor Johnson, in 1875, in the *Chicago Medical Examiner*, July 1, 1875.

This beautiful specimen of pure cholesterin (weighing 174.29 grs.) was removed from an abscess of the abdominal walls, near the anterior superior spine of the right ilium. The patient recovered entirely after a few months' trouble with a fistula. (Fig. 3.) Finally, this specimen (Fig. 4) was removed by myself a month or so ago from the centre of a solid tumor occupying partly the abdominal wall, and dipping into the abdominal cavity in the region of the gall-bladder. The operation was exploratory in character to determine the nature of the tumor, and this stone, weighing 42.46 grs., was accidentally hit upon. Microscopically, examination of sections of the tumor shows nothing but fibrous tissue. Was the tumor a result of the irritation incidental to the presence of this stone? It has begun to disappear.

Fig. 3.

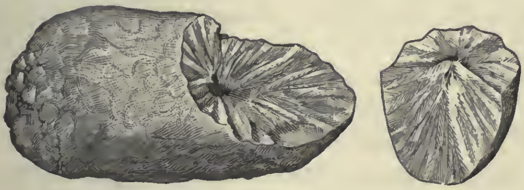
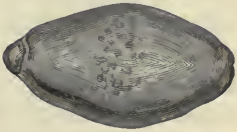


Fig. 4.



A reasonably sure diagnosis can be always made by means of exclusion. The chronic character of the symptoms, their prolonged existence without any especially noticeable changes in surrounding organs, with accompanying systemic manifestations, are characteristic.

The paroxysmal pain, coinciding, as it does, with periodic biliary secretion and flow, is almost pathognomonic. The presence of a determinable tumor adds to the certainty. To my way of thinking, exploratory puncture with the needle is neither safe nor desirable, nor necessary.

The safety of the operation is plainly demonstrated by the tables of operations so far given. Ending September 3d, 1884, Drs. Keen and Musser tabulate thirty-five cases. There have been reported since then two cases by Mr. Tait, one by Mr. Savage, one by Mr. Taylor, and one by myself, bringing the total number of operations up to forty.

In this list are found recorded ten deaths, but these statistics show no deaths in uncomplicated cases of cholecystotomy. The relief given seems so far to be almost immediate as well as permanent. I cannot bring myself to believe that cholecystectomy, either partial or complete, is either rational or safe surgical operation.

Dr. J. McF. Gaston, of Atlanta, Ga., has published, in the *Atlanta Medical and Surgical Journal* for September and October, 1884, a most complete and commendable paper on the surgery of the gall-bladder, embracing also a very graphic *résumé* of the attending troubles requiring surgical interference in diseases of that organ. In this paper Dr. Gaston advocates the establishment of a fistula, between the bladder and the duodenum, by fastening the walls of the two viscera together, and making an opening through the adherent surfaces at the time of the operation instead of making an external fistula, in this way providing a passage for the biliary secretions along their normal channel and securing all its benefits to the general system. He has successfully performed the operation recommended upon dogs.

Nature often takes the same course, and practically secures the same kind of a fistula as Dr. Gaston advises to be made in many attempts to get rid of these calculi. One objection to the adoption of such a procedure rests on the fact that it enhances, perhaps greatly, the danger of an operation which has so far been proven to be comparatively safe and entirely reliable in giving relief.

It would be presumptuous to advise the general practice of sounding the common duct through the external opening, from its results in this single trial; still it is quite sure that such procedure can be safely carried out, and equally certain that its adoption in this case resulted in relief that did not follow the removal of the calculi alone.

ARTICLE VI.

SINGULAR CASE OF ABSENCE OF ADIPOSE MATTER IN THE UPPER HALF OF THE BODY.[1]

By S. WEIR MITCHELL, M.D., of Philadelphia.

WE see very often loss of fat in some local atrophies, but this defect always accompanies like changes in the muscular masses. The following case, however, seems to point to the possibility of the existence of separate centres capable of restraining the deposits of adipose matter of normal amount, while yet the skin remains healthy as to texture and the muscles strong and of unaltered bulk.

In the present most valuable example of disease the skin and muscles are as to nutrition in good order, but the fat of certain regions is almost completely absent in the upper half of the body; at the same time there are in both arms places where there is some analgesia, a fact which points like a finger-post to the probability of the site of the defect of fat deposit as being in some portion of the posterior segment of the cord.

B. C., æt. 12, school-girl. Family history good; two other children in family, both healthy. Patient was a bottle-fed baby; dentition was regular and normal; did not walk until over two years old; was quite fleshy at the time, and wore braces on account of weak ankles. Whooping-cough when three months old.

With these exceptions the child was considered perfectly healthy until the winter of 1878; she then "took cold," and had a quite severe cough, with considerable expectoration; this attack lasted two or three months, and left her weak and somewhat emaciated. During the next summer and winter the emaciation continued to increase, and this was particularly noticeable in her face, which alone at that time attracted her parents' attention.

In the autumn of 1879, it was noticed for the first time that the legs, buttocks, and abdomen did not share in the marked wasting of the face, arms, and trunk.

About this time, and later on in the case, free perspiration, particularly of the trunk and neck, but also of the forehead, arms, and feet, was observed, both during the day and night; this at times was so marked that treatment was instituted to arrest it, but without success.

Since then the child has grown in breadth and height, although the emaciation has continued unchanged. She has been well able to keep up with her school-fellows in their studies, and physically has been rather more active and vigorous than her playmates.

Present Condition.—The child is four feet one-quarter inch in height; she is uncommonly bright, and, with the exception of the emaciation, seems in perfect health; her appetite, digestion, bowels, and sleep are normal; teeth good; no signs of rachitis. Upon stripping her it is seen that there is an almost total absence of fat in the upper part of her person; this is most notable in her face, which has a haggard appearance and looks like that of an old woman; her arms are very thin; the chest is also emaciated; the breasts exhibit, however, some signs of development, and offer a curious contrast to the bony frame on which they lie. The muscular masses stand out in remarkable relief because of the lack of fat, and are, I think, fully developed.

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[1] Communicated to the Philadelphia Neurological Society, March 23, 1885.

In marked contradistinction to this condition of the upper part of her person is the appearance of her abdomen, buttocks, and legs; these are plump, and present all the appearances of belonging to a very well-nourished child. In the thighs, the thickness of the skin and connective tissue as grasped between the thumb and finger seems to measure about half an inch; there is no pitting, although the tissues appear rather denser than usual. The color of the skin is everywhere good, and there is no mottling or change in temperature from the normal. The hair is light in color, is devoid of much natural moisture, and there is a marked tendency to the collection of dandruff. No change in the nails was noticed. The grasp of both hands is good, even more powerful than usual for a child of her age; she is strong, and is able to suspend herself for some time by her hands with her arms flexed, and while in this position all the muscles of the upper extremities can be plainly mapped out. There is no fibrillary twitching or wasting of the smaller muscles of the hands.

When told to rise from a supine position, she does so quickly, and without any effort or attempt to assist herself by placing her hands on her thighs; there is no curvature of the spine or spinal tenderness, and she can pick up an object from the floor in front of her quickly and with ease. The patellar knee-jerk is present on both sides, alike, and is normal. The abdominal reflexes are likewise good; tapping over the pectorals causes the usual slight fibrillary twitch extending laterally from the point struck; there is no chin reflex.

The pupils are normal in size, alike, and respond freely to light. The eyesight is good.

Over the outer surfaces of the lower part of both forearms towards the ulnar side there appears to be slight analgesia, pin-pricks causing but little feeling of discomfort, and bleeding but slightly. Elsewhere sensation is normal. The power to localize a touch is good even over the region of partial analgesia. Sensation in the legs normal. There are no signs of unilateral or partial flushings of the body or extremities.

Heart-sounds are normal, with the exception of slight accentuation of second sound at right base. Lungs and abdominal organs apparently perfectly healthy. Reaction to Faradic current, normal. Reaction to galvanic current, normal. Urine, normal. Eyes, normal.

ARTICLE VII.

THE PNEUMONIA-COCCUS OF FRIEDLANDER (*Micrococcus Pasteuri*, Sternberg).[1]

By GEORGE M. STERNBERG, M.D., Surgeon U. S. Army.

IN this paper I desire to call attention to the so-called pneumonia-coccus of Friedlander, which I shall take the liberty of naming *Micrococcus Pasteuri*. My right to name the micrococcus discovered by Friedlander in the exudate of croupous-pneumonia must depend upon my ability to make good the claim which I here state, viz.: that the pneumonia-coccus of this author is, in fact, identical specifically with a micrococcus previously described by me, which is found in normal human saliva, and with that found by Pasteur in the blood of rabbits which had been injected with the saliva of a child who had died of hydrophobia in one of the Paris hospitals.[1]

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[1] Read before the Pathological Society of Philadelphia, April 17, 1885.

In attaching to this micrococcus the name of the illustrious French chemist I have no desire to perpetuate the memory of the mistake he made in supposing for a time that it was the germ of hydrophobia. Having found that this was a mistake, he did not fail to correct it; so no doubt Koch will do if he has made a mistake in announcing his "comma-bacillus" as the much sought cholera-germ. It is easy to make mistakes in this field of investigation; easier, perhaps, than to acknowledge them. And believing, as I do, in human fallibility, I have no hesitation in questioning the conclusions of the most illustrious workers in the field of micro-biology, if they are in conflict with my own observations. On the other hand, if, upon fuller investigation, I am convinced that I have been mistaken in regard to this or any other question, I shall feel no hesitation in following the example of Pasteur in making a public acknowledgment of my error. At all events the name will stand for the oval micrococcus which produces a fatal form of septicæmia in rabbits, and which is constantly present in my buccal secretions.

If I am right as to the specific identity of this micrococcus with the micrococcus discovered by Friedlander in the exudate of croupous-pneumonia, it does not follow that Friedlander is wrong in assigning to this organism an etiological *rôle* in connection with this disease. This is a question which I will not discuss at the present time, as I hope to make it the subject of experimental inquiry at as early a date as practicable.

In giving a specific name to a micrococcus which I first observed nearly five years ago, and which I have repeatedly studied by means of oil immersion objectives—the one-eighteenth and one-twelfth inch hom. im. of Zeiss—by the most approved methods of staining and cultivation, and by numerous experiments upon animals, I can scarcely be accused of undue haste. And, inasmuch as this is the first microörganism which I have attempted to name among the multitude which I have encountered in the course of my bacteriological studies, I may be acquitted of any special proclivity for conferring names upon supposed "new species," as is the fashion among amateur naturalists.

I have heretofore spoken of this particular micrococcus as "the micrococcus of septicæmia in the rabbit;" but, as there is more than one form of infectious septicæmia in the rabbit known to us by laboratory experiments, each due to a different microörganism, this term is evidently inexact. Moreover, it would indicate that this particular micrococcus finds its usual habitat in the blood of rabbits affected with the form of septicæmia to which it gives rise. This is by no means true, for the organism in question is widely distributed, and it is only by inoculation experiments that the fact has been developed that it is a pathogenic species, as far as rabbits are concerned. I made this discovery in the summer of 1880, quite accidentally, having injected a little of my own saliva under the skin of a rabbit, as a comparative experiment, to ascertain whether a fluid supposed to be innocuous would give rise to any febrile disturbance. The promptly fatal result, and the presence of a multitude of oval organisms in the blood, at once aroused my attention, and, as is well known, I have since made numerous additional experiments, at different times and places, and always[1] with the same result: The animals die in from 24 to 48 hours; they present the same pathological appearances; their blood is infectious in the smallest quantity, and it contains vast numbers of the oval micrococcus which I now name *Micrococcus Pasteuri.*

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[1] Comptes rendus Ac. de Sc., 1881, xcii. p. 159.

Upon making sections of the tissues of a rabbit dead from this form of septicæmia, the oval micrococci are found in great numbers in the capillaries of the various organs, as I am prepared to show. Repeatedly I have produced this infectious disease in rabbits by injecting beneath their skin pure cultures of the micrococcus in question.

All this is a matter of record, and the experimental proof is as definite as is that offered by Koch in regard to the fatal form of septicæmia in mice which he has so well studied, or in the better known infectious disease, anthrax. Yet, in spite of my detailed record of experiments made, of my frequent repetition of these experiments, and of my photographs from nature which illustrate my first paper, published in 1881, and the article upon septicæmia in rabbits in my book,[2] which was published more than a year ago, I find in Klein's recent work[3] the following reference to my experiments:—

> "That saliva of the healthy dog, and of man inoculated subcutaneously into rabbits sometimes produces death in these animals [Senator] had entirely escaped his [Pasteur's] notice. Sternberg has proved this in an extensive series of experiments. His own saliva proved sometimes fatal to rabbits. They die of what is called septicæmia, and Sternberg thinks it due to the micrococci; but this is not to be considered as proved."

I claim that the fact is proved, and that the experimental evidence of this has been upon record for nearly four years, and I am prepared to repeat the experiments, and to demonstrate that such is the case. I look upon the fact that an infectious disease of a lower animal may be induced by inoculation with a microörganism which is habitually found as a harmless parasite in the mouth of man, as something more than a curious circumstance to be recorded and forgotten, and as having an important bearing upon vital questions relating to the genesis of "disease germs," questions which are now largely occupying the attention of leading pathologists in all parts of the world. But in the discussion of these questions I must insist that experimental evidence obtained on this side of the Atlantic is entitled to just as much consideration as that which comes to us from across the water. And, unless the truth of my detailed account of experiments made is impeached, I can only account for such a verdict as that which Klein has recorded in the sentence above quoted, upon the supposition that he has not read the evidence presented, or that he is controlled by a geographical bias, unworthy a true student of science, in estimating its value.

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[1] In a few instances only, out of a large number of experiments, have rabbits survived the injection subcutaneously of a few minims of my saliva.

[2] Bacteria. Wm. Wood & Co., New York, 1884.

[3] Micro-organisms and Disease. 1885.

In the blood of rabbits recently dead, and in fresh cultures, *Micrococcus Pasteuri* presents the appearance shown in Figs. 1, 2, and 5. The oval elements vary considerably in their dimensions, and especially in length, and are seen solitary, in pairs, or in chains of three or four. When undergoing rapid multiplication they are commonly in pairs, but in surface cultures long chains are often formed as seen in Fig. 3. In these the individual cocci approach more nearly to a spherical form than in the pairs encountered in the blood of a rabbit just dead, where they are often so much elongated as to appear rod-shaped. My observations indicate that these rod-like forms are upon the point of division into two pairs of oval

Fig. 1.

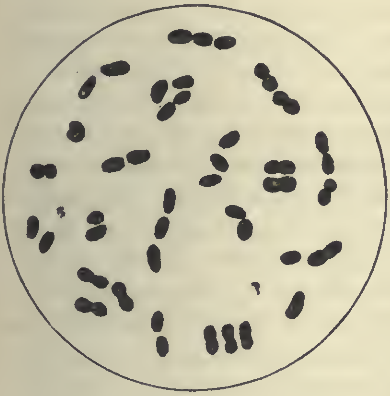

Fig. 2.

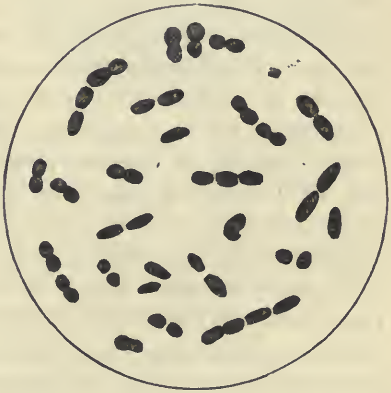

Fig. 1.—*Micrococcus Pasteuri* from blood of rabbit inoculated subcutaneously with normal human saliva (Dr. S.). Stained by the method recommended by Friedlander. Magnified 1000 diameters.

Fig. 2.—*Micrococcus Pasteuri* from blood of rabbit inoculated subcutaneously with fresh pneumonic sputum from a patient in the seventh day of the disease. Same staining and amplification as Fig. 1.

Fig. 3.

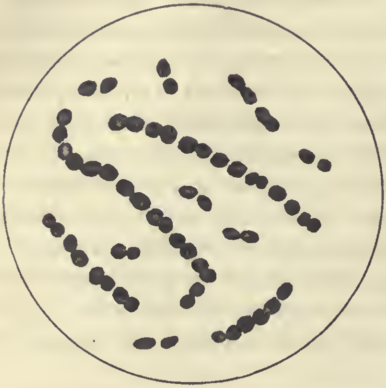

Fig. 4.

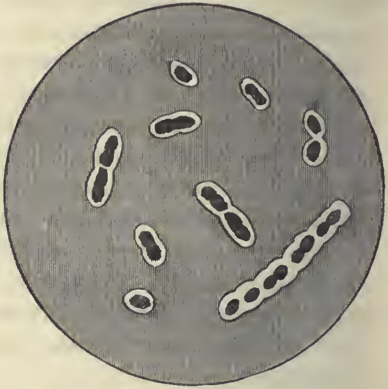

Fig. 3.—Surface culture of *M. Pasteuri*, showing development of long chains. Same staining and amplification.

Fig. 4.—Surface culture of *M. Pasteuri* from blood of rabbit injected with pneumonic sputum, showing the so-called "capsule" of Friedlander. Same staining and amplification.

elements, and, indeed, upon close inspection with high powers the commencement of transverse division may be recognized in each element of the pair. Morphologically, these pairs of oval or rod-like elements closely resemble the ordinary bacteria of putrefaction—*B. termo*, and might easily be mistaken for this organism. The supposition that they are identical is easily disposed of. Our micrococcus is, under all circumstances, motionless, while *bacterium termo* is an actively motile organism. *Micrococcus Pasteuri* is difficult to cultivate, being exceedingly sensitive as regards the composition and reaction of the culture medium. It does not give rise to any putrefactive odor in fluids in which it is present in the greatest abundance. In liquid cultures it only causes a slight opalescence of the culture medium, and its presence upon the surface of Koch's "flesh-peptone-gelatine" can only be detected by close observation. It does not liquefy the gelatine, and does not grow readily on the agar-agar gelatine. In blood serum and in liquid culture media, it is seen with difficulty under the microscope, owing to the fact that its refractive index does not differ greatly from that of the fluid containing it. On the other hand, *B. termo* thrives in any medium containing gelatine, or albumen, and causes this to undergo putrefactive decomposition.

The pneumonia coccus of Friedlander is also described as oval in form, or as being found in pairs and in short chains. According to Talamon, "it has the form of a grain of wheat, of from 1 to 4 μ in length, and one-half to 1 μ in diameter. It is isolated, more frequently in pairs, and sometimes in chains of four." This corresponds with the description I have given of *M. Pasteuri*. During the past winter I have made the acquaintance of this micrococcus as it appears in pneumonic sputum, and

I find that morphologically it does not differ from my *Micrococcus Pasteuri.*

But how about the "capsule" which Friedlander has described as the distinguishing character of the pneumonia-coccus? Dr. Friedlander's first communication was made to the Medical Society of Berlin, on the 19th November, 1883, and this capsule was described as something quite new, and as characteristic of the pneumonia-coccus. In the spring of 1881 I made the accompanying photo-micrograph (see Fig. 6), in which oval micrococci in pairs and chains of three or four elements are surrounded by a capsule exactly resembling that described by Friedlander in his communication made two years later. This photo-micrograph was reproduced by the heliotype process, and appears as one of the illustrations which accompany my paper on "a fatal form of septicæmia in the rabbit," published in vol. ii., No. 2, of *Studies from the Bibliographical Laboratory* of Johns Hopkins University. This journal, however, is not likely to come under the eye of medical men, and it is not surprising that the paper referred to had escaped the attention of Friedlander. The same paper was published in the *Bulletin of the National Board of Health*, of April 30, 1881, but without the heliotype illustration. The micrococci with "capsules" are also shown in Fig. 3, of Plate VI., in my book on "Bacteria," published in 1884.

Fig. 5.

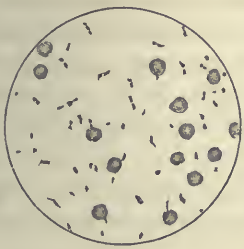

Fig. 6.

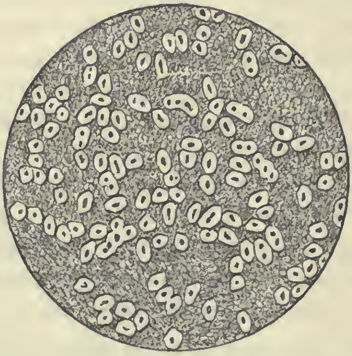

Fig. 5.—"Pneumonia coccus" (*M. Pasteuri*) "in the pericardial exudate of a rabbit dead with fibrinous pneumonia, double pleurisy, and pericarditis from an inoculation with the cultivated microbe." (After Talamon, taken from Prof. Germain Sée's recent work—*Des Maladies Specifiques du Poumon*—in which it is Fig. 2 of Plate 1.) Amplification not stated.

Fig. 6.—From a photo-micrograph made by the author of this paper in 1881, and used in April of that year to illustrate a paper on "A fatal form of septicæmia in the rabbit induced by the subcutaneous injection of human saliva." The preparation is from the blood of a rabbit recently dead, and is stained with an aqueous solution of iodine and potassic iodide. Magnified 1000 diameters. Photographed with Zeiss's one-eighteenth inch hom. oil im. objective.

Unfortunately a mistake has been made in the descriptive text facing this plate in my book, where the statement is made that the micrococci in this figure were stained with methyl-violet. This mistake was due to a fault of my memory, and to a failure to refer to my original paper published more than two years before, where the statement is clearly made that "in these photographs the staining was effected with iodine solution." (p. 196.)

Another mistake occurs in the same page of descriptive text, which I take this opportunity to correct. The reference to Fig. 3, in the eighteenth line, should have been to Fig. 4, and the text should read, "believed to be identical with those shown in *Fig.* 4, and with *micrococcus ureæ*"—referring to a micrococcus which is especially distinct from our *M. Pasteuri.*

There can be no question as to the morphological identity of the micrococcus represented in this photo-micrograph with that described by Friedlander, and the capsule was brought out in the specimen from which this photo-micrograph was made by the use of the same staining solution which Friedlander recommends for its demonstration, viz., a weak aqueous solution of iodine dissolved by the aid of potassic iodide. In my paper referred to I say, "In these photographs the staining was effected with iodine solution," and a little further on I give the formula as follows "(iodine grains iii, potassic iodide grs. v, distilled water grains 200)." In the same paper I give the following account of this envelope of mucous material which Friedlander describes as a capsule.

> "The most striking morphological difference between the micrococcus, as shown in Figures 2, 3, and 4, and in Figure 1, is the aureole which surrounds the well-defined dark central portion in the latter figure.
>
> "Pasteur says of this appearance: 'This organism is sometimes so small that it may escape a superficial observation. . . . It is an extremely short rod, a little compressed towards the middle, resembling a figure 8. . . . *Each of these little particles is surrounded at a certain focus with a sort of aureole which corresponds perhaps to a material substance.*'
>
> "Pasteur's inference that this aureole represents a material substance, and is not simply the result of diffraction, is fully sustained by my observations and my photographs. The slighter aureole seen in Figures 2 and 3 is probably a result of diffraction; but the use of aniline violet as a staining fluid promptly demonstrates that in Figure 1 we have to do with a material substance. The refractive index of this substance must be very nearly that of blood-serum, for it is with great difficulty that this aureole can be distinguished without the aid of staining material. It may be seen by the practised eye with a good immersion lens, but, as already mentioned, even the darker central portion, which alone is seen at first, may easily escape observation, and a false impression is obtained as regards the real size of the organism. When, however, a small drop of blood, dried upon a thin glass cover, is immersed for a minute or two in a solution of aniline violet, and then washed and examined with, even, a good one-fifth inch objective, the observer will be astonished to find a multitude of organisms, solitary, in pairs, and in chains, having a diameter of more than 1 μ, and mostly possessing an oval or elongated form, which might lead to the inference that they should be referred to the genus *Bacterium* Duj., rather than to *Micrococcus* Cohn.
>
> "The reason of this apparent change in dimensions as the result of staining is that the substance which constitutes the almost invisible aureole is deeply stained by the aniline, and the central portion, which was before seen because of its highly refractive index, is now lost to view in the uniform and deep violet color which the whole organism possesses."

Friedlander says with regard to his so-called capsule that several microchemical tests justify the conclusion that it consists of mucine, or of a substance resembling mucine. His account shows that it is not constantly present, and varies greatly as to the extent of its development. In this his pneumonia-coccus also corresponds with my *Micrococcus Pasteuri.* The development of this external envelop of mucine to the extent shown in my photo-micrograph is altogether exceptional. I have not yet ascertained the exact conditions which control the development of this envelope, but believe it to be most marked in a rich culture-medium, and as a result of an exceptionally vigorous and rapid development of the micrococcus.

Friedlander says: "The formation of capsules appears to be an attribute of the pneumonia cocci at the highest point of their development."[1]

Prof. Germain Sée, in his recent work,[2] after giving an account of Friedlander's method of staining, says:—

> "Friedlander attaches such an importance to the capsule of the micrococcus that he declares that it is never wanting in acute fibrous pneumonia, and that in all the other forms of pneumonia studied by him he has only found cocci without capsules. Nevertheless we must hasten to say, this capsule has no value whatever. Talamon does not refer to it. According to him it does not belong to the coccus; it is the result of the mode of preparation and staining of the exudate. It is met with in various microbes found in bronchial mucus treated by the method of Friedlander. This is also the opinion of Professor Cornil. He says: 'We believe, M. Afanassiew and myself, that the appearance is due simply to a retraction of the liquid around the micro-organism, and that the capsules are produced artificially.' On the other hand, Fraenkel, at the Medical Congress in Berlin of 1884, declares that the formation of the capsule is not a constant phenomenon; that this capsule is formed in other schizomycetes; finally that it is not possible to consider the capsules as characteristic of the micrococcus of pneumonia. Friedlander himself, at the same Congress, replying to Fraenkel, has given the last blow to this famous capsule, in admitting that that which characterizes the micrococcus of pneumonia is neither the capsules, nor its cultures in nail-form, but the sum of the morbid phenomena which it determines. There should then be no further question of micrococci with capsules. It is the form of the microphyte which ought to be taken as characteristic, joined to its pathologic effects as shown by inoculation." (Op. cit., p. 98.)

A second distinguishing character assigned by Friedlander to his pneumonia-coccus was its peculiar nail-like mode of growth in gelatine cultures. Klein has made the curious mistake of speaking of the coccus itself as nail-shaped. In his recent work,[3] he says (p. 329): "They are oval, of *a peculiar nail-like shape*, about 0.001 mm. long," etc.; and again on the following page: "The micrococci were of *the peculiar nail-like shape*, and were characterized by a mucinous capsule."

Prof. Sée, in the work above referred to, shows that the nail-like growth in gelatine cultures is after all not a character of any great value, and that the body of the nail is formed by the growth of the organism along the track of the inoculating needle, and the head by a little knob upon the surface of the gelatine at the point of entrance. Professor Sée says:—

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[1] From a review by Warwick in Centralbl. f. kl. med. Wissensch., Berl. 1884, No. 7, p. 107.

[2] Des Maladies spécifiques du Poumon, Paris, 1885.

[3] Micro-organisms and Disease, London, 1885.

> "According to Friedlander the cultures have a peculiar aspect: upon the surface of the gelatine a little elevation is formed from which a whitish substance extends downwards into the nutrient gelatine. This is what the German author speaks of as a nail-shaped culture. The coccus develops at the temperature of the chamber and does not liquefy the gelatine. Here again Friedlander has been mistaken, in describing this aspect of the culture as a peculiarity of the pneumonia microbe. The nail form does not depend upon the organism, but upon the manner in which one introduces it into the gelatine-peptone, by means of a platinum wire." (Op. cit., p. 90.)

At the same time that Friedlander was pursuing his researches with reference to the etiology of pneumonia in Berlin, Talamon was engaged in similar studies in the laboratory of the Hôtel-Dieu in Paris. His first communication was made to the Anatomical Society, November 30, 1883, a few days after Friedlander's communication to the Medical Society of Berlin. This author has nothing to say about a capsule. The morphology of the organism found by him in the pneumonic exudation, drawn from the lung during life by means of a hypodermic syringe, or obtained post-mortem, corresponds with that of my *Micrococcus Pasteuri*, as will be seen upon referring to Figure 5, which is copied accurately from an illustration in the recent work of Professor Germain Sée, already referred to. Talamon experimented upon twenty rabbits, two guinea-pigs, four dogs. Injections of liquid cultures directly into the pulmonary tissue of the guinea-pigs and dogs gave a negative result. Of twenty rabbits inoculated in the same manner with the exudate from cases of pneumonia, or with liquid cultures, four recovered after showing symptoms of being sick for five or six days; the others died. Of those which succumbed, two presented no alterations of the lungs, which were scarcely congested, but a "fibrino-serous pleurisy" and fibrinous pericarditis were found. In eight rabbits there was fibrinous pneumonia, sometimes involving an entire lung, sometimes only the inferior lobe. In these cases also there were pleurisy and pericarditis with fibrinous and serous exudation. The blood of the rabbit contained the oval micrococcus in abundance. I call attention here to the fact reported in my first paper on "a fatal form of septicæmia in the rabbit," viz.: that the guinea-pig is less susceptible than the rabbit, and that the dog shows no susceptibility. Nevertheless two out of three of my guinea-pigs succumbed, one in three and one in seven days, while Talamon's guinea-pigs did not die. Moreover, Talamon injected six rabbits subcutaneously, and these all withstood the injection, and showed no special indications of ill-health. If then the organism injected was the same as that which I have found to kill rabbits almost without fail, within forty-eight hours, we must admit at least that it has not the same pathogenic potency. My own observations lead me to believe that this micrococcus when obtained from the same source differs in pathogenic powers at different times, and that while probably present in the saliva of healthy persons generally, it has not in all cases the same degree of pathogenic power. Thus, in my original experiments, I report as follows:—

> "The saliva of four students, residents of Baltimore (in March), gave negative results; eleven rabbits injected with the saliva of six individuals in Philadelphia (in January) gave eight deaths and three negative results; but in the fatal cases, a less degree of virulence was shown in six cases by a more prolonged period between the date of injection and the date of death. This was three days in one, four days in four, and seven days in one."

I also mention the fact that the buccal secretions of two Cuban gentlemen, medical students in Philadelphia, proved to be quite as virulent when injected beneath the skin of rabbits as my own. This, taken in connection with the circumstance that I have spent much time in the South, led me to think that possibly this unusual degree of pathogenic power might be due to the fact that the variety of the micrococcus to which it is due, and which is constantly in cultivation in my mouth, came from a southern latitude. This supposition receives some support from the experiments of Claxton[1] made in this city, at the University of Pennsylvania, in 1882. The results reported were in general in conformity with those previously reported by myself, but they showed that the saliva of all persons does not exhibit the same pathogenic potency as manifested by its effects upon rabbits, for of eighteen rabbits injected with the saliva of seven individuals four recovered, five died in less than five days, four in five to ten days, and four in ten to fifteen days. Claxton remarks: "I also have observed the same remarkable virulence in the residents of tropical countries, as Cuba and Brazil, as also in the case of negroes, the saliva of which latter race exhibits it to an extreme degree."

The difference in pathogenic power shown by this oval micrococcus as found in the buccal secretions of healthy individuals corresponds with a difference in the results obtained by three different experimenters who have injected pneumonic sputum into rabbits, in different latitudes. Thus Friedlander reports a negative result from nine injections made through the thoracic walls, while Talamon had sixteen fatal cases out of twenty injected, and Salvioli,[2] whose experiments were made in Italy, reports a uniformly fatal result, within forty-eight hours, from similar injections made into four rabbits. The greater pathogenic power of the material injected by Salvioli is shown by the fact that his rabbits all died within forty-eight hours, and also by a uniformly fatal result from injections into guinea-pigs (9). The pathological appearances resulting from the injections practised in these two species of animals were identical, and correspond with those which I had previously obtained from the injection of normal human saliva. All of the authors mentioned refer to tumefaction of the spleen, as a constant result. Both Talamon and Salvioli refer to the abundant presence of the oval micrococcus in the blood, and effused serum in the pleural cavity, of animals which have succumbed to the injections made. The paper of Salvioli is illustrated by some very well-drawn figures, which illustrated the morphology of the organism found by him in the pneumonic exudate and in the blood of animals into which this has been injected. Fig. 7 is copied accurately from this author's Fig. 2, and shows that his pneumonia coccus is identical morphologically with my *Micrococcus Pasteuri.* The results obtained by the author last mentioned, like those of Talamon and of Friedlander, are supposed by their author to establish the fact that croupous pneumonia is an infectious disease. Without denying this fact, we submit that these results are in conformity with the claim made in the present paper as to the specific identity of the oval micrococcus found constantly in the pneumonic exudate with the micrococcus found in normal human saliva which produces an infectious form of septicæmia in rabbits. In support of my claim as to the physiological identity of the oval micrococci from these two sources I offer the following literal translation of the experiments of Salvioli upon rabbits :—

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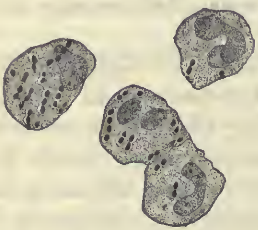
[1] Philadelphia Medical Times, June 17, 1882.

[2] G. Salvioli. Natura infettiva della pulmonite crupale. Arch. per le scienze Mediche, vol. viii. pp. 127–148 (1884).

Fig. 7.



Copied from illustration accompanying the paper of Dr. G. Salvioli in the *Archivo per le Scienze Mediche,* Turin, vol. viii. Tar. viii. Fig. 2. "Cells of the pleuritic exudation containing pneumonia cocci, mounted in Canada balsam." Stained with gentian violet.

"*Jan.* 17, 3 *P. M.*—Rabbit weighing 1970 grammes; very thin when purchased. Injected into right thoracic cavity, 1.5 c. c. of the usual exudation. The rabbit died at 10 A. M. on the 19th. At the post-mortem examination made immediately after death we noted: collection of turbid serum in the right pleural cavity which coagulated after being drawn. Fibrinous pseudo-membrane upon the surface of the lung, especially the inferior lobe. Lung, especially the inferior lobe, enlarged and congested, contains little air. Upon section a little serum escapes from the surface. Spleen congested. Characteristic pneumonia cocci in the pleuritic exudation; not in spleen. Upon microscopical examination of an indurated piece of lung, micrococci were found in the costal and visceral pleuræ, and in the pulmonary tissue, presumably between the lymphatics; and in the pulmonary alveoli. Near the pleura a slight collection of fibrinous exudation."

"*Jan.* 20, 3 *P. M.*—Rabbit weighing 2080 grammes, of Sardinian race, of exceptional resistance, and therefore adapted for the experiment. Injected into right thoracic cavity 1 c. c. of the exudate from the dog"—killed at a previous experiment.

"At noon on the 21st the rabbit was found dead. At the autopsy a turbid liquid, rich in pneumonia cocci, was found in the right pleural cavity; infiltration of the mediastinal cellular tissue by a turbid serum rich in cocci, fibrinous pseudo-membrane upon the right pleura. Spleen enlarged, and with cocci; in its pulp. At the examination of a hardened specimen cocci were found in the pleura, visceral as well as parietal, and also in the pulmonary tissue in the vicinity of the pleura. In this, also, was found a little of the fibrinous exudation in the alveoli."

"On the 28th I received another specimen of exudate from the medical clinic, which had been extracted[1] from a patient with fibrinous pleuro-pneumonia, in the twelfth day of sickness. The slightly turbid liquid had an alkaline reaction and pale yellow color. When allowed to stand a sediment was deposited corresponding to one-eighth of the liquid column. A microscopic examination of the sediment showed the presence of leucocytes, red globules, a quantity of granular material, and some very rare pneumonia cocci, but slightly stained, notwithstanding a repetition of the preparation; instead I observed some smaller granules which did not take the color, which resisted drying, and which I have called spores. This exudate I injected into two guinea-pigs, two rabbits, and two dogs. *Only the rabbits gave me a favorable result.*[2] The other animals survived and did not present the slightest disturbance."

"*Jan.* 28, 1 *P. M.*—Rabbit weighing 1920 grammes, injected into right thoracic cavity 1 c. c. of the above serum after mixing up the sediment. The rabbit was found dead on the morning of the 29th, and at the autopsy there was an abundant, turbid, sero-fibrinous, exudation in the right pleural cavity, fibrinous pseudo-membrane upon the pleura. The cellular tissue of the mediastinum was infiltrated with turbid serum, parenchyma of right lung partly deprived of air by compression, with this exception normal, [free translation for '*del resto nulla di particolare.*'] Spleen enlarged; pneumonia cocci in the pleuritic exudation and in the splenic pulp. At the microscopic examination of a hardened piece the pneumonia cocci were found in the pleura, in the pulmonary tissue also, at a distance from the pleura.[3] In some alveoli, in the vicinity of pleura, was found a fibrinous exudation.

"*Jan.* 28, 2 *P. M.*—Rabbit weighing 1890 grammes; injected into right thoracic cavity 1 c. c. of limpid serum. On the morning of the 31st the rabbit died, and at the autopsy were found turbid exudation in right pleural cavity, fibrinous pseudo-membrane upon the pleura, right lung enlarged, resistant, non-crepitant; the inferior lobe presented the aspect of red hepatization, pronounced tumefaction of the spleen. The characteristic pneumonia cocci were found in the exudate, in the pulmonary juice, and in the splenic pulp."[4]

I shall now record some recent experiments made by myself.

November 29, 1884.—Inoculated rabbit subcutaneously with pneumonic sputum brought to me by a medical gentleman in Baltimore, from a patient, aged 60, in the sixth day of the disease. The doctor had carried this sputum in his pocket for twenty-four hours before handing it to me. Result negative.

January 2, 1885.—Inoculated two rabbits subcutaneously with pneumonic sputum, collected with great care by my friend, Dr. Rohé, and brought to me at once—from a white male patient, aged 19, in the seventh day of illness, second day of bloody expectoration. Both rabbits were found dead on the morning of January 4. In both the pathological appearances were identical with those constantly observed by me in rabbits killed by the subcutaneous injection of my own saliva, viz., extensive inflammatory œdema extending from point of injection, enlarged spleen, and presence of oval micrococci in blood and in effused serum in the subcutaneous connective tissue. Fig. 2 is drawn from a slide mounted at the time, and represents this micrococcus as seen in the blood.[5]

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[1] I understand that the liquid was extracted from the pleural cavity by an aspirating syringe, although this is not distinctly stated.—G. M. S.

[2] Italics by translator.

[3] They had invaded the blood and were distributed through the capillaries generally. —G. M. S.

[4] Op. cit., p. 133.

[5] This and the other figures illustrating the present paper are from camera lucida drawings made by my laboratory assistant, Dr. A. C. Abbott, of Baltimore.

Remarks.—It may be asked whether possibly my *Micrococcus Pasteuri* may not have been present, accidentally, in the pneumonic sputum, as a result of the fact that the exudate into the alveoli of the lungs must come in contact with the buccal secretion of the patient when it is expectorated. In reply to this supposition I would say that I have a slide, which I shall be happy to submit for the inspection of the microscopical experts, which shows the capsule of Friedlander in a most beautiful and unmistakable manner. This slide is from a surface culture which was started from the blood of one of these rabbits inoculated with pneumonic sputum. (See Fig. 4.) I cannot, then, doubt that this is in truth the micrococcus described by Friedlander, and, as in the blood of the rabbits, it was identical morphologically with my *Micrococcus Pasteuri* (compare Figs. 1 and 2), and shows identical physiological characters when injected beneath the skin of these animals, I feel justified in assuming the specific identity of the micrococci from the two sources.

March 14.—Four rabbits were injected subcutaneously with a small quantity (about 1 c. c.) of my own saliva. Two of these rabbits were found dead on the morning of March 16, and the other two died during the morning. All presented the usual pathological appearances so often described, viz., enlarged spleen, extensive subcutaneous œdema, slight hemorrhagic extravasations, etc. The blood of all of these rabbits contained the oval micrococcus in abundance. (Fig. 2 is drawn from a preparation mounted at the time.) Cultures were started from this blood, and served for the following experiment.

March 31.—I injected into the thoracic cavity of two rabbits, by means of a hypodermic syringe, a small quantity of a culture of *M. Pasteuri*, in Koch's flesh-peptone gelatine. Both rabbits were found dead the following morning. In both the pleural cavity contained turbid serum, and there was a fibrinous deposit upon the surface of the lung on the side (right) into which the injection was made. The margin of the lung in one appeared congested, but there was no inflammation of the lungs, which floated in water.

Remarks.—Death occurred in these cases more promptly than when I have injected the same material subcutaneously. This is not surprising, for it seems probable that the blood would be invaded by the parasite more promptly when it it is thrown into the pleural cavity than when injected subcutaneously. As a matter of fact, in injecting saliva, or culture fluids subcutaneously I have observed that the animal commonly presents no indications of being ill during the first twenty-four hours, and that during this time the inflammatory œdema at the point of puncture has made but little progress, as shown by the slight extent of local tumefaction. The pleurisy and fibrinous exudation upon the surface of the lung in these rabbits correspond with what the authors above referred to have reported as a result of the injection in the same way of pneumonic exudate. It may be that if death had not occurred at so early a period, the lungs would have become involved, and that these cases could have been placed beside those reported by Talamon, in which unmistakable pneumonia is said to have been produced by the injection into the thoracic cavity of rabbits, of pneumonic exudate, or of culture fluids. The superior pathogenic potency of the micrococcus in my experiment above reported is shown by the brief period between the time of injection and the date of death. But, although this period was less than twenty-four hours, the blood of these rabbits, as well as the effused serum in the pleural cavity, contained the oval micrococcus in vast numbers.

I have been led to suspect, from the fact that while fibrinous pleurisy is a constant result in the experiments reported by Talamon and by Salvioli, fibrinous exudation in the lung tissue is only occasionally found, that perhaps the development of pneumonia depends upon the penetration of the lung by the point of the syringe and the injection of the infectious material directly into the lung substance. I can easily understand how this result might occur, if the local effect of the presence of the micrococcus in the lung is the same as when it is introduced into the subcutaneous connective tissue, that is the infiltration of the tissue with an inflammatory exudate, which gives rise to the appearance which I have generally spoken of as an inflammatory œdema.

April 7th, 4 *P. M.*—Injected through the walls of the thorax, on the right side, by means of a hypodermic syringe, a small quantity of pneumonic sputum, from a case in the practice of Dr. Mitchell. The sputum was collected with due care by my laboratory assistant Dr. A. C. Abbott. Both rabbits were found dead the following morning. There was considerable turbid serum in the right pleural cavity, and a fibrinous deposit upon the surface of the lung of the same side. The lung floated in water and gave no evidence of being inflamed, but was stained of a reddish color. The spleens of these rabbits were but slightly enlarged.

Remarks.—I have frequently noticed that in cases so quickly fatal, tumefaction of the spleen is not so marked as in cases of longer duration. The blood of one of these rabbits contained the oval micrococcus in great abundance; blood drawn from the femoral vein of the other contained a small number of the same organism, in pairs and chains of three or four. The turbid serum from the pleural cavity contained the microbe in great numbers.

Since the above was written the following experiment has been made:—

On the afternoon of April 9th Dr. Councilman, Assistant in Pathology in Johns Hopkins University, and Pathologist at Bay View Hospital, handed me a portion of hepatized lung from a case of pneumonia at Bay View, in which the post-mortem examination was made within six hours after death. The exudate, scraped from a freshly-cut surface of the lung tissue, was spread upon thin glass covers, and stained by the method recommended by Friedlander for the demonstration of his so-called pneumonia-coccus. Micrococci of oval form in pairs and in chains of three or four elements were found in abundance, but they were not surrounded by a capsule.

April 9th, 4 *P. M.*—A little of the exudate, scraped from a freshly cut section of the hepatized lung above referred to, was mixed with distilled water and injected into the right thoracic cavity of a small rabbit, by means of a hypodermic syringe. At the same time a little of my own saliva was injected into another small rabbit, of the same litter, in the same manner. Rabbit No. 1, injected with pneumonic exudate, was found dead on the morning of April 12. Upon opening the cavity of the thorax the lungs were found to present a normal appearance, except that the inferior lobe of right lung had a blood-red color, apparently due to a hemorrhagic infarct; both lungs floated in water. The right pleural cavity contained turbid serum, in which, as well as in the blood, the presence of numerous oval micrococci was demonstrated by microscopical examination. Several specimens were stained by the method recommended by Friedlander, but no distinct appearance of a capsule was made out. The spleen was considerably enlarged.

On the morning of April 13, rabbit No. 2 was found dead. There was but slight evidence of pleurisy, but the right lung was indurated, of a gray color, and sank in water.

Remarks.—The spleen of this rabbit was not enlarged, and its blood did not contain the septic micrococcus. The development of pneumonia in this case was doubtless due to the fact that the point of the syringe had penetrated the lung, and the injection had been made directly into the lung tissue. Such a result must depend to a great extent upon accident, and in making injections through the thoracic walls it is impossible to say in advance of the *post-mortem* examination whether the fluid has been injected into the pleural cavity or into the lung substance.

A microscopical examination of the lung after it had been hardened in alcohol showed that there was a necrotic focus of some extent surrounded by an extended area of indurated lung tissue, which presented the appearance of catarrhal rather than of croupous pneumonia. There was also interstitial hemorrhage in the vicinity of the necrotic centre, and there can be little doubt that this marked the point to which the syringe had penetrated when the injection was made. The oval micrococcus was not found in the inflamed lung tissue, and I am not able to ascribe to it any special import in the development of the inflammation in this particular case.

I must now refer to Friedlander's experiments upon mice, guinea-pigs, and dogs, and shall quote from the recent work of Prof. Sée already referred to:—

> "All of the mice succumbed in from eighteen to twenty-eight hours after the injection. At the autopsy the lungs were found to be highly congested, almost empty of air, and to contain foci—*noyaux*—of red induration. Out of eleven guinea-pigs six died with pneumonic lesions. Out of six dogs one only succumbed. In another series of experiments mice were made to inhale a spray of a culture fluid containing the coccus in suspension. Several of these animals succumbed. At the autopsy Friedlander says that he found the appearance of typical pneumonia, and verified the presence of numerous micrococci with capsules in the lungs, the spleen, the blood, and the pleural liquid." (Op. cit., p. 90.)

I would like to inquire how it is that to produce pneumonia in animals Friedlander and his followers consider it necesary to introduce the infectious material into the pleural cavity or into the substance of the lung itself with a sharp-pointed instrument. If this coccus is the germ of infectious pneumonia, one would think that to inject it subcutaneously ought to give rise to the local lesion, just as the subcutaneous injection of tuberculous sputum gives rise to tuberculosis of the lungs. We find from the accounts given that when injected into the lung or introduced by inhalation, the micrococcus invades the blood, and produces enlargement of the spleen; but to produce the characteristic local inflammation which it is supposed to be the especial function of this micrococcus to produce, it does not suffice to inject the micrococcus beneath the skin or into the blood; it must be injected through the walls of the thorax with a sharp-pointed syringe. And when so injected only a certain proportion of the animals have pneumonia. Prof. Sée, while accepting Talamon's experiments upon rabbits as demonstrating the infectious nature of croupous pneumonia, is not inclined to accept the demonstration which Friedlander claims to have made by his experiments upon mice. He says:—

> "The rather brief description of the lesions in the mouse, which Friedlander has given, leaves some doubt in the mind; for the presence of centres—*noyaux*—of induration in the congested lungs does not suffice to characterize fibrinous pneumonia."

I would here call attention to the fact referred to in my first paper on a fatal form of septicæmia in the rabbit, viz: that in this infectious disease there are sometimes found hemorrhagic infarcts in the lungs. I quote from this paper as follows:—

> "Pasteur says, 'The lungs are frequently filled with the *noyaux* of pulmonary apoplexy.' (I have found this to be the case in one out of three rabbits examined since my attention has been directed to this point.) 'A character more constant than the last (not more constant, however, than that which relates to the volume and color of the *ganglions*), is the state of the trachea, which is almost invariably red, congested, with little hemorrhages from the smallest vessels.' (I have found a marked congestion of the vessels of the trachea in the three cases in which I have examined it, and in one case the lymphatic glands of the axillæ were enlarged and congested.)"

The possibility has frequently occurred to me that this same micrococcus may be concerned in the etiology of diphtheria. The fact that it causes inflammatory œdema of the subcutaneous connective tissue, and that when introduced into the pleural cavity it causes a copious fibrinous deposit upon the lung, taken in connection with the fact that it has been shown to be a pathogenic organism having different degrees of potency under different circumstances, seems to justify the suspicion that there may be a pathogenic variety which has a special propensity for locating itself in the mucous membrane of the fauces. Certainly the suddenly developed inflammatory œdema and fibrinous exudation which characterize malignant diphtheria, correspond with the local effect produced when this micrococcus is inoculated into susceptible lower animals. The experiments of Löffler[1] seem to show that the widely-distributed spherical micrococcus which forms long chains and zooglœa masses is not the germ of diphtheria, and this observer speaks of a *bacillus* as being found in the deeper portion of the pseudo-membrane in cases of diphtheria. I have no exact information as to the morphology of this bacillus, but knowing that, in the nomenclature of some bacteriologists, the same micrococcus is reserved exclusively for spherical organisms, I am not prepared to dismiss this supposition without further investigation.

I herewith submit the following conclusions for consideration :—

The pneumonia-coccus of Friedlander is identical specifically with the micrococcus previously described by me, and which is commonly found in normal human saliva. The capsule, or mucous envelope, which sometimes surrounds this micrococcus, described by Friedlander in 1883, and photographed by me two years previously, cannot be accepted as a distinguishing character of this species, inasmuch as it is not constantly present, and the circumstances upon which its development depends have not been accurately determined. It is established that this is a pathogenic organism, as far as certain lower animals are concerned, and that its pathogenic power varies under different circumstances. It seems extremely probable that this micrococcus is concerned in the etiology of croupous pneumonia, and that the infectious nature of this disease is due to its presence in the fibrinous exudate into the pulmonary alveoli.

But this cannot be considered as definitely established by the experiments which have thus far been made upon lower animals. The constant presence of this micrococcus in the buccal secretions of healthy persons indicates that some other factor is required for the development of an attack of pneumonia ; and it seems probable that this other factor acts by reducing the vital resisting power of the pulmonary tissues, and thus making them vulnerable to the attacks of the microbe. This supposition enables us to account for the development of the numerous cases of pneumonia which cannot be traced to infection from without. The germ being always present, auto-infection is liable to occur when from alcoholism, sewer-gas poisoning, crowd-poisoning, or any other depressing agency the vitality of the tissues is reduced below the resisting point. We may suppose also that a reflex vaso-motor paralysis, affecting a single lobe of the lung, for example, and induced by exposure to cold, may so reduce the resisting power of the pulmonary tissue as to permit this micrococcus to produce its characteristic effects.

Again, we may suppose that a person, whose vital resisting power is reduced by any of the causes mentioned, may be attacked by pneumonia from external infection with material containing a pathogenic variety of this micrococcus having a potency, permanent or acquired, greater than that possessed by the same organism in normal buccal secretions.

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[1] I have not the paper of this author at hand, and am indebted to an editorial in the *Medical Record* of Jan. 31 for the facts here given.

The figures which illustrate this paper are from the following sources:—

Figures 1, 2, 3, and 4 are from camera lucida drawings made by my laboratory assistant, Dr. A. C. Abbott, of Baltimore, to whom I am also indebted for valuable assistance in conducting the recent experiments herein recorded. The drawings were made with an amplification of 2500 diameters, obtained by the use of a Geiss's one-eighteenth inch homogeneous oil immersion objective and a high eye-piece (Powell and Lealand large stand, tube drawn one inch). These drawings have been reduced by photography to two-fifths, in order to give an amplification of 1000 diameters in the figures.

ARTICLE VIII.

THE REFRACTION OF THE HUMAN EYE. A CRITICAL STUDY OF THE STATISTICS OBTAINED BY EXAMINATIONS OF THE REFRACTION, ESPECIALLY AMONG SCHOOL CHILDREN.

By B. ALEX. RANDALL, A.M., M.D., Ophthalmic and Aural Surgeon to the Episcopal and the Children's Hospitals, Phila.

THE great importance of full sharpness of vision is a matter which is steadily obtaining wider-spread recognition, and is demanding still more earnest consideration of all thinking persons. Defective sight is growing more notable for a variety of reasons, and the means of amending it are progressively improving and are more widely employed, thus furnishing constant reminders of the need of such help; yet they are making only the more distinct those classes of cases which are but partially, if at all, remediable, and driving us to the more thorough study of the causes of these defects and the means for their prevention. The progress which has been made in all branches of knowledge, especially the natural sciences, is constantly increasing the field to be covered in the usual educational process. The demands made upon children at their lessons have steadily increased; while the assumption of the matter of education by the state, as a duty owing to itself and its citizens, has carried the influence of the schools, sometimes by compulsion, into every rank of life. Conditions, therefore, which not long since invested only the few, are now the environment of the community. Census reports point to a steady and rapid decrease, in every country making claim to civilization, of that portion of its inhabitants unable to read and write; while means and attractions to the exercise of these powers are offered by veritable floods of literary productions and reproductions, by postal facilities which would have been deemed a few decades since utterly beyond belief, and by an immense broadening, for almost every one, of the field of every-day interest. Some information on almost all points is expected of every one; and the most abstruse discoveries of modern science in revealing new worlds, measuring the globe, or investigating its components and the creatures which live or have lived upon it, are quickly absorbed into the fund of general information, and go to widen or to modify that stock of knowledge of which all are expected to be cognizant.

And the means to the attainment of the major part of all this is the eye. Most children begin to study the alphabet and its combinations before the fifth year, and a few years more finds them all readers. School tasks surround and occupy them much of the time, and of what remains not a little is given to amusements hardly less exacting in their demands for the use of the eyes in accurate vision. The general spread of the employment of artificial illumination has lengthened greatly the hours during which the eyes can be rigorously exercised, and the child whose school work is finished turns to other reading for recreation. In the general walks of life vision, and good vision at that, is being more and more strictly required—how much we are hardly likely to appreciate at first. Yet if we think of any one, of whatever age or rank, suddenly deprived of vision, we will, perhaps, in some measure realize how essential to almost every employment is the lacking sense. How few are the paths now open to the blind, and in them, how difficult it is that they should at all cope with seeing competitors! The disadvantages of those with defective vision differ in degree rather than in kind. In every one of our eye clinics the cases are numerous where persons reject with alarm the advice that they should wear glasses, knowing, as they do, that such an assumed confession of visual defect may cost them a present situation, and will certainly count to their prejudice in seeking any new place. All this is but a fraction of the evidence showing how much is required, even outside of the schools, of the visual powers of those who have them in the usual measure.

The present century has seen the introduction of methods and instruments of precision into almost every branch of study, most notably in all which would lay any claim to scientific value. The inductive method is almost universal, and each advance is a generalization from extended observations. The observer works for the instruction of the community as well as himself; his results must receive confirmation in order to meet general acceptance; and to this end standards of comparison more or less constant and methods free as far as possible from the personal equation have become essentials. Advancing with the general realization of the importance of good vision, ophthalmology has furnished means more and more exact for the determination of the visual acuity and for the measurement and correction of its defects; until we are now in position to obtain data in these matters as strictly accurate as any in the whole range of natural science.

In the mean time, investigation after investigation has been made in the matters of vision and refraction, embracing enormous numbers of individuals, in the endeavor to answer the numerous hygienic and social questions involved in the subject of defective vision. Early realizing that, to obtain results of general applicability, eyes presumably normal must be the objects of study, and that in youth many of the causes of defect have not yet come into play, the eyes of school children have been most frequently examined, both to obtain information as to the important subject of the special hygiene of schools, and also to gain data as to what is to be regarded as the standard eye, the typical form, the normal, which the various conditions of imperfection have failed to attain. This standard determined, and the statistics of the primary variations from it once settled, we will be in position to study the questions of the general prevalence of defective vision, the causes which are effective in evoking it, and the measures to be employed in combating the evil.

The foundations of such a wide-reaching study must, of course, be broad. Furthermore, they must be sure ; lest the crumbling of some of the constituents should imperil the stability of all that is built upon them. The first condition would seem well answered, since no student of the subject, not even Prof. Cohn, has up to the present time had the patience to collect all the statistics of the matter already in print ; yet arrays of scores of investigations, based upon thousands of individuals, are to be found in the summaries which have been given by various authorities. In the other direction much remains to be desired in not a few of these studies, so much, indeed, that some of them can be employed in any summarizing of results only within the narrowest limits. Setting out in many instances with some single object in view, such as the question of the prevalence of myopia, attention has been given to it alone, and their negative showings in other directions are often valueless, even where the positive results are reliable. Yet they are often grouped as all equal and competent portions of evidence, and advantage is taken of their wide divergence on many important points, either to employ the convenient ones in the support of any fallacy, or else, by holding them up into view in their apparent contradiction, to throw discredit upon all such investigations and the so-called science which they in some measure represent. There has been almost no attempt to combine a critical examination of the methods, details, and results of this extensive series of investigations, with a summary embracing all that are accessible. No light work nor a pleasant one, dealing as it must with comparisons more or less odious, yet a task which the writer here undertakes in the belief that valuable results are thus to be attained. That these results will display any striking novelty is not to be hoped ; but that they may give added weight to concurrent testimony derived from other sources, and perhaps widen the acceptance of views not yet receiving their due appreciation, seems abundant reason for the labor necessary to educe them. Where a hundred investigators have expended years of study in gathering statistics on so weighty a subject, surely there is place for one to combine the data thus gathered. If only to show that much of the labor has been wasted in the past, and to give indication of the points to-day demanding elucidation and the methods by which they are to be studied out, this study would appear to be called for. That it can give or disseminate much other valuable information will, it is hoped, be made to appear.

A comparison of the numerous investigations which have been made in the field before us shows the utmost variation in their aims, methods, and results. Great as are the differences, however, the studies will repay careful scrutiny, and in few instances will we fail to find reason for discrepancies. In most of the examinations the question of the occurrence of myopia and its increase was paramount; in many, it alone was studied. Indeed, the earliest investigators knew of nothing else in our field to seek, and the methods at their command were hardly sufficient for its discovery. Even after hypermetropia and astigmatism became well known they were rarely sought with any care, and vision equal to normal was considered, sometimes even defined, as synonymous with emmetropia. In many of the investigations each eye was not separately tested, so that practically only the better eye was studied, and any difference between the two overlooked. Investigating the subject with rather vague hygienic views, the individual was quite naturally the centre of interest. If he could see with normal sharpness, whether with one eye or both, he was not a myope, and the requirements of the matter were considered to be satisfied. Among the later examinations such oversights are, naturally, rarer; yet often the meagre reports available either give no information on such points, or afford it in such indefinite terms as to leave them still in doubt.

In many of the studies the nature of the refraction has been carefully determined; but the degrees of the anomalies found have either not been determined or not reported. Others state these important details for the class, the age or the year of school life; yet, omitting the mention of the actual numbers of individuals or eyes embraced under each heading, the results, valuable as they may be in themselves, cannot be combined with those of others. In some of the cases where the ophthalmoscope was employed in the examination of every eye (and in the many where it was not used, a most important aid to accuracy was omitted), it was used to seek for lesions and not to measure the refraction. It is needless here to repeat that in the aims held by some of the investigators such details had no place; and that in studies so comprehensive in the matter of numbers examined, the introduction of the methods of extreme refinement would have been impracticable. What most concerns us is the stability, the correctness, of our foundations. The subject here taken up is the information which these examinations *can* afford as to the usual refraction of the human eye; in health, as far as we may exclude pathological conditions; in youth and in age, if the data are to be found: to extract all that is germane to our purpose. And when grave omissions or vexatious errors, generally typographical, have to be pointed out, it will be with full realization from the writer's own experience, of how hard it is to avoid error in statistical reports, and how impossible for one man to comprehend in his investigation all those points that to another may seem most interesting or essential. And if, in passing, we cannot conceal a regret that some study, most valuable in some respects, gives us no information in others, it will be with no thought of adverse criticism—rather in testimony to the value of that which is given.

To begin this study with a series of definitions, where the subject has been so much written about, may seem unnecessary, if not presumptuous. Yet, since loose employment of technical terms constitutes the principal ground of fallacy in statistics, the cardinal vice, which can make figures the most lying of witnesses, it is essential that some points be absolutely defined, and then the data of various observers be marshalled under these headings with the strictest accuracy which the details at hand will permit.

Waiving technicalities as far as possible: the *refraction* of the eye is the relation of the situation of the percipient retina to the focus of the lens system of the passive eye, for rays of light coming from distant objects. When, without any effort, the focus for such rays falls on the perceiving layer of the retina, the eye is *emmetropic*. When the eye is relatively too long to meet this condition, it is *myopic;* its retina is in position to receive the focus only of rays coming from some point not remote; it is *nearsighted.* When relatively too short, the eye is *hypermetropic;* without accommodative effort, or its equivalent, the eye can focus no rays of light that occur in nature; distant objects form undefined images upon the retina; near objects form images still less clear.

Vision is the perception of external objects through the agency of the rays of light coming from them and impressing the retina. Its acuity depends upon the formation of a sharp image upon this membrane, and upon the capacity of it, and the visual centres behind it, to take cognizance of the image so found. Granted the latter conditions in full measure, the acuity of vision depends upon the transparency of the ocular media and the refraction, primary or fictitious, of the eye. By fictitious refraction is meant every deviation from its primary condition above defined, whether produced by accommodative effort or by optical appliances, such as lenses. Conditions of imperfect retinal perception and of non-transparency of the media before it, may for our purposes be grouped under the heading *amblyopia*, and practically laid aside, and we have before us the subject of the visual acuity of the human eye as dependent upon its refraction, this last being divisible into real or primary, and fictitious or apparent, refraction. The real or primary refraction is the object of our present search; and we will endeavor to winnow out of the mass of results furnished by a long series of investigations those which have bearing upon it, and try to solve with their aid the question—What is the normal refraction of the human eye?

Since we have at our command easy methods of determining with the utmost accuracy the visual acuity in any case; this, the most salient practical point of our study, can be directly measured; and as by wide obsertion we have obtained reliable data as to the average sharpness of vision, we can make ready use of it as a means to our end, only noting that the tests must be strictly applied. The farthest point of distinct vision for the myopic eye is not remote, hence normal vision at a distance without lenses at once excludes myopia: but the opposite condition of hypermetropia is far more difficult to exclude. Exercise of the accommodative power, which in the myope only makes distant vision worse, can in the hypermetropic eye cover up the defect of refraction and raise vision to the normal; nay, more, the small pupil, and probably the tension of accommodation and its effects, may raise vision above that which we hold to be the average. Vision above the normal is rather indicative of hypermetropia. The accommodation must be set aside in order to reveal the real refraction, above defined. A convex lens held before the eye will render the rays coming from distant objects convergent, and only a hypermetropic eye can focus such rays, and see normally at a distance through a convex lens. The accommodation used to render the eye apparently emmetropic is now unnecessary, and can only impair vision; it may, therefore, be laid aside, and the eye then *manifests* its hypermetropia. But a lifelong habit will not always yield in an instant. The accommodative tension may be maintained, distant vision is made worse by a convex lens, even the weakest; and we are driven to other methods to attain our aim. Dark surroundings are conducive to relaxation of accommodation, and the glare of light reflected into the eye by the ophthalmoscopic mirror may aid, or at least not counteract, the influence. This method, then, in expert hands, may as it were surprise the eye into a revelation of its defect. Yet all such measures may fail, and nothing short of absolute paralysis of accommodation by a mydriatic will tell the whole story. Irritative causes have perhaps set up a cramp of the ciliary muscle, a spasm of accommodation, which will yield but obstinately to the most powerful mydriatic.

The accommodation, then, is the factor which introduces uncertainty into the investigation; study of it can sometimes clear away doubts. The range of accommodation is at each age approximately a constant: if a part of it be called into play to cover up hypermetropia, by thus much will the range be shortened. Here we have not only a clue to the existence of such a condition, but also some indication of the amount of accommodation thus rendered *latent;* and hence of the amount of hypermetropia neutralized. Where astigmatism is absent, very accurate results may often be thus obtained. Similar measures may be employed to determine the presence and also the degree of myopia, and to exclude the cases where nearsight is simulated by accommodative spasm; but the same difficulties may be met and nothing less than total paralysis of accommodation will enable us to claim absolute accuracy. Still more is this the case with astigmatism; and although we can in addition to other methods, get absolute results by ophthalmometric measurements as to corneal asymmetry, we have only one—the most important—of the series of factors involved.

To turn, now, to the practical workings of an examination, let us see what information we can obtain, and how we may prove the existence of emmetropia, or other conditions of refraction. Testing of the visual acuity will show it to be normal or subnormal—the former excluding myopia. If subnormal, the use of convex or concave lenses may show the presence and degree of *absolute hypermetropia* or *apparent myopia*, respectively. In all these tests each eye must be separately tried; but sometimes the testing of both together may be also advantageously employed. Convex glasses held before eyes with normal vision may reveal hypermetropia ("H. facultative manifest" of Donders), or in case of their rejection will speak for apparent emmetropia. The various tests for astigmatism may show the presence of this defect, and indicate, perhaps correctly, the meridians of greatest and least refraction in the media of the eye. These data may be confirmed by the ophthalmoscopic examination, most especially in the direct method and in retinoscopy; the cornea may be measured with the ophthalmometer, and the range of the accommodation may be determined and compared with the standard furnished by Donders. Concurrence of these various tests will greatly enhance the confidence which would be due to the findings of any one of them alone; and the presumption will be strong that eyes, which by all tests appear emmetropic, are so in fact. Only by paralysis of the accommodation, however, can this be absolutely settled, and the emmetropic eye be proven to be actually such; then no latency of hypermetropia could enlarge the list of seeming emmetropes, and no spasm of the accommodation could decrease it by causing apparent myopia. Then, too, the *degree* of any error of refraction could be exactly measured—all previous tests claiming to furnish but an approximation.

One principle must rule in all these tests. Accommodation is to be done away if possible. It can increase temporarily the refraction of the eye, lessening or covering hypermetropia, increasing the degree of myopia, or making apparent myopes of those really emmetropic or hypermetropic. There is nothing tending to the contrary—no counter-force to oppose it or to introduce error in the other direction. The lowest grade of myopia, therefore, or the highest grade of hypermetropia, obtainable by any method of competent accuracy, is the nearest approximation to the real refraction. All data in this direction are positive; all to the contrary, merely negative. Hypermetropia proven by any one test, for example, is to be considered as the true refraction of the eye, although every other test points to the contrary. The one test, to stand thus in conflict with all others, must be well based; it should be repeated to obtain confirmation from itself; but standing still, it is to be accepted as correct—all the others are probably vitiated by the deceiving activity of the accommodation. Of the various methods of examining the eye with unparalyzed accommodation, that by the ophthalmoscope is most frequently able to act such a part. The conditions of accuracy must be fulfilled and the observer must be competent; then its findings can be maintained against any array of others, which point towards myopia, *i. e.*, in the direction in which accommodative activity would tend.

In the abstracts which follow, the original reports of the examinations have been strictly followed in every case where they have been accessible; the source of information actually employed being given in the appended bibliography, to which the numbers refer. Abstracts and reviews have also been studied to obtain all possible collateral information; in this regard, and also as a source of most quotations which have had to be made at second-hand, use having been most frequently made of the "Jahresbericht über die Leistungen und Fortschritte im Gebiete der Ophthalmologie." Our study being of *eyes* and not individuals, this as well as convenience or conciseness has here and there dictated a recasting of the forms in which the results have been given; but effort has been made to do the least violence consistent with our needs to the observer's own arrangement, and none whatever to his actual results. Occasionally, palpable error in the summing up given by the examiner has driven us to work over his detailed results, and figures have been thus obtained differing (rarely in notable degree) from his totals. Information as to the actual *numbers* being more important to our ends than percentages, these numbers have been worked out when not given—always with the proviso that they are merely approximations. All results which are not in perfect accord with those of the investigator cited are indicated by parentheses, or, if derived by the writer from percentages, etc., by brackets. The varying nomenclature and standard of the schools in which many of the investigations have been made, and of their classes, makes uniform arrangement in this regard well-nigh impossible. The designation of the equivalent American school has been sometimes given, but the untranslatable "Realschule" and other similar terms, have been retained. Age, being looked upon as the best basis of comparison for our purposes, has been so employed whenever the data permitted. As to the "Gymnasium," it may be remarked that its curriculum extends generally from the fourth year of school-life about as far as the Sophomore studies of our American colleges; while in the "Realschule" the course is approximately parallel, but with lighter stress upon the classical studies.

No.	Date.	Examiner.	Character of examined.	Age.	Persons.	Eyes.	Em. per ct.	M. per ct.	H.m. per ct.	H. per ct.	As. and Amb.
1	1813	Ware	Foot guards, England	....	10,000		....	0=0?			
	“	“	Chelsea Military scholars, England	....	1,300		....	3 0.25?			
	“	“	University students, Oxford	....	127		....	32 25.2?			
2	1848	Szokalski	Primary scholars, Paris	....	6 300		....	0 0?			
	“	“	College and Lyceum pupils, Paris	....	977+		....	114 [11.6]			
3	1856	Schürmayer	Grammar-school pupils, Baden	....	930		....	46 4.9			
	“	“	Normal school, etc., pupils, Baden	....	2172		....	392 18.4			
4	1861	v. Jaeger	Infants, children, and soldiers, Vienna	9d. 25y.	(800)	700	223=31.8	416 59.4	....	61=8.7?	
5	1866	Rnete	Free and charity school pupils, Leipsic	....	213(2514)[1]		[12]	48 [22.5]	55=[25.8]		
6	1867	Reck	School-children, Brunswick	....	2250		....	?			
7	“	Alexander	Primary scholars, Aix	....	869		....	?			
8	“	Gaertner	Theological graduates, Tübingen	±19	138	276	41=14.9	231 83.7	?		
9	“	Cohn	Village primary pupils, Breslau, etc.	6–13	1486		1408 94.7	22 1.4	16= 1.1	......	Am. 34
	“	“	City elementary pupils, Breslau	6–14	4978		4245 85.3	334 6.7	127 2.5	......	222
	“	“	Secondary and Grammar pupils, Bres.	7–17	1260		995 78.9	109 8.65	52 4.12	......	90
	“	“	Realschule and Gymnasium, Breslau	9–22	2336		1682 72.	539 23.	44 1.9	......	50
10	“	“	University students, Breslau	17–27	410		134 32.7	244 59.5	15 3.7	......	17
11	1868	“	Type-setters, Breslau	20–71	132		51 38.7	68 51.5	10 7.6	......	3
12	“	Thilenius	Gymnasium scholars, Rostock	....	314		175 55.7	96 30.6	9 2.9		
13	1870	Schultz	Gymnasium scholars, Upsala	12–16	431		?	159 36.9	?		
14	1871	Erismann	Pupils of various schools, St. Petersburg	8–24	4358		1132 26.	1317 30.2	1889 43.3		
							[App. Em. 67]			(Atropine)	
15	“	Cohn	Village scholars, Silesia	6–13	240	480	14 3.	4 0.9	370 77.	438=91.2	24
16	“	Maklakoff	School children, Russia	....	759		482 63.5	254 33.5	23 3.		
17	1872	Cohn	Gymnasium pupils, Breslau	6–22	361		187 52.	125 35.	25 7.	......	24
18	“	Krüger	Gymnasium pupils, Frankfort	9–19	203	406	159 39.	162 40.	(72 17.7)	83 20.6	
19	1873	v. Hoffmann	Gymnasium pupils, Wiesbaden	9½–19	256	512	140 27.3	187 36.5	[101 19.7]	171 33.8	9
	“	“	Girls prep. & gram. pupils, Wiesbaden	6½–15	403		203 50.4	83 20.6	87 21.5	(94 23?)	23
	“	“	Boys prep. & gram. pupils, Wiesbaden	6½–16	568		321 56.5	67 12.	37 6.5	145 25.5	35
20	“	v. Reuss	Gymnasium pupils (1872), Vienna	....	409	818	243 29.7	375 45.8	158 19.3	[184]	42
	“	“	Gymnasium pupils (1873), Vienna	....	389		144 37.	166 42.7	69 17.7	......	4
21	1874	Ott & Ritzmann	Gymnasium pupils, Schaffhausen	....	122	244	124 51.	96 39.3	24 10.	?	
22	“	Ott	Realschule pupils, Schaffhausen	12–14?	164	324	146 45.	37 11.1	122 37.7	?	As. 19
23	“	Cohn	Old villagers, Silesia	60–84	100	200	49 24.5	25 12.5	114 57.	114 57.	12?
24	“	Gayat	Pupils of various schools, Lyons	6–14	600		440 73.3	52 8.7	108 18.		
									= or >1. D.		
25	“	Burgl	Girls Grammar school, Munich	10–17	179		[72] 40.	88 49.2	19 10.7		
26	“	Dor	Realschule pupils, Berne	10–18	430		279 64.9	125 29.	18 4.18		
27	1875	Callan	Negro prim. & grammar school, N. York	5–19	457		81 17.7?	12 2.6	289 67.	350 76 5	
28	“	v. Reuss	Gymnasium pupils, Vienna	....		480	159 33.1	177 34.6	49 10.5	132 28.3	

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[1] Only those having eye-trouble were sent for examination.

No.	Date.	Examiner.	Character of examined.	Age.	Persons.	Eyes.	Em. per ct.	M. per ct.	H. m. per ct.	H. per ct.	As. and Amb.
29	1875	Pflüger	Teacher recruits, Switzerland	20–25	529		....	112=21.2			
30	1876	Conrad	Gymnasium pupils. Königsberg	6–20	1518	3036	909=29.94	678 22.33	357=11.76	1441=47.47	
31	"	Adler	Deaf-mute pupils, Vienna	8–19	100	200	64 32.	10 5.	126 63.		
32	"	Spalding	Primary and Grammar pupils, Portland	5–15	2372		....	244 11.?			
33	"	Pflüger	Pupils of various schools, Lucerne	7–23	1846		862 46.	184 10	800 44.		
34	"	Emmert	Pupils of various schools, Berne, etc.	5–55	2148	4296	422 9.82	542 12.61	3308 77.		
35	"	Loring & Derby, R. H.	Pupils of various schools, New York	6–21		2265	1531 67.59	448 19.78	286 12.63	?	
36	"	Scheiding	Gymnasium pupils, Erlangen	8–		746	187 25.1	371 49.7	188 25.2		
							[166 12.4]	[224 18.8]			
37	"	Koppe	Pupils of various schools, Dorpat	....	661	1332	279 20.9	270 20.3	687 51.5	[904 67.8]	As. 92
38	1877	Kotelmann	Normal scholars, Hamburg	8–20	413		240 58.	157 38.	8 2.		
39	"	"	Realschule pupils, Hamburg	....	232		....	[60] 26.			
	"	"	Grammar scholars, Hamburg	....	310		....	[77] 25.			
	"	"	Pupils of girls private school, Hamburg	....	104		....	[18] 17.			
	"	"	Pupils of girls private school, Hamburg	....	218		....	[48] 22.			
	"	"	Girls' normal school pupils, Hamburg	....	45		....	[19] 42.			
	"	"	Primary scholars, Hamburg	....	296		....	[36] 12.			
40	"	Classen	Realschule pupils, Hamburg	....	402		....	165 41.	34 5.5		
41	"	Bacon	District scholars, Hartford	7–17	308	616	464 75.3	102 16.5			
42	"	Steven	District scholars, Hartford	7–17	675		....	[120] 18.			
43	"	Becker	Gymnasium pupils, Heidelberg	....	287		154 53.	100 35.	33 12.		
	"	" [1]	Grammar pupils, Heidelberg	....	261		....	[34] 13.			
44	"	Agnew [Williams & Ayres]	Primary district pupils, Cincinnati	....	630		507 80.5	85 13.5	37 6.		
	"	" [Cheatham]	College students, New York	....	549	1097	651 59.	333 30 3	105 9.6		
	"	" [Prout & Mathewson]	Tech. Institute pupils, Brooklyn	....	300	600	372 62.	79 12.5	126 21.		
45	"	Derby, Hasket	College freshmen (Harvard) Boston	....	122		....	[36] 20.5			
46	"	Niemann	Gymnasium pupils, Magdeburg	....	325		....	[156] 49.			
	"	"	Grammar school pupils, Magdeburg	....	388		....	[171] 44.			
47	"	Cohn	Watchmakers, jewelers, lithographers, Breslau.	19–71	172		116 67.4	28 16.2	25 14.5	....	As. 3
48	1878	Dor	Lyceum pupils, Lyons	5–23	1016	2026	1300 64	568 28.	= or >1 D.		
49	"	Ott	Gymnasium pupils, 1876, Schaffhausen	....	120	240	90 37.5	98 40.8	87 4.2		
50	"	Seggel	Recruits, grad. of Gymn. etc., Munich.	18–24	284		....	164 58.	52 21.6		
51	"	Reich[2]	Pupils of various schools, Caucasus	....	1259		[529] 42.?	[365] 29.?	....	[428] 34.?	=5.
52	"	Burchardt	Gymnasium pupils, I and II, Berlin	....	61	122	....	76 62.3	....		
53	"	Roosa[3]	Med. Students and graduates, N. York	21–31	14		3 22.	....	0 0	11 78.	
54	"	———	Gymnasium pupils (II & I), Hesse	....	177	354	?	[209 59.3]			
55	"	Haenel	District school, boys, Dresden	6–15	432	854	[470 55.	182 21.3	202 23.7]		
	"	"	District school, girls, Dresden	6–14	382	764	[317 41.5	209 27.3	238 31.2]		
	"	"	City school, boys, Dresden	6–14	368	736	[429 58.3	186 25.3	121 16.4]		
	"	"	City school, girls, Dresden	5–14	364	726	[409 56.3	166 22.9	151 20 8]		
	"	"	Girls school pupils, Dresden.	7–16	171	337	[187 55.5	95 28.2	55 16.3]		

[1] Perhaps the same as No. 112.

[2] The percentages foot up 110 per cent. through a typographical error.

[3] Atropine.

No.	Date.	Examiner.	Character of examined.	Age.	Persons.	Eyes.	Em. per ct.	M. per ct.	H.m. per ct.	H. per ct.	As. and Amb.
	1878	Haenel	Realschule, Dresden	8–17	209	417	[204=48.5	161=38.5	52=12.4]		
	"	"	Kreuzschule, Dresden	9–21	554	1100	[460 41.5	554 50.	86 7.8]		
	"	"	Gymnasium, Dresden	9–21	480	953	[450 46.9	449 46.8	54 5.62]		
	"	"	Royal Seminary, Dresden	13–21	218	432	[164 37.9	236 54.8	32 7.4]		
	"	"	Private Seminary, Dresden	13–20	131	261	[103 39.5	134 51.3	24 9.2]		
56	1879	Derby, Hasket[1]	College freshmen, Amherst	15–24	321		145 45.2	114 35.9	67 20.9	?	
57	"	Horstmann	Young children [Berlin?]	8–24m.	57	96	13 13.5	9 9.4	....	(Atropine) 74=77.	
58	"	Netoliczka (vide 82)	Pupils of various schools, Graz								
59	"	Jost	Pupils of various schools, Zittau	....	1229	2458	(1426 57.7)	735 29.9	234 9.3	[1660 67.?]	
60	"	Nicati	Primary and lyceum pupils, Marseilles	....	1717	3434	....	522 15.5			
61	"	Kotelmann	Uncivilized, Hamburg	3m–46y	26	51	14 28.	0 0.	35 71.4	(37)	
62	"	"	Gymnasium pupils, Wandsbeck	8–17	283	566	182 31.62	110 19.43	273 48.83		
63	1880	Smith, Priestley	Pupils of Board-schools, Birmingham	7–13	1636		....	86 5.3			
	"	" "	Pupils of normal schools, Birmingham	18–23	357		....	72 20.			
64	"	Ely	Infants, New York	1–60d.	111	154	21 14.	27 18.	....	(Atropine) 106 69.	
65	"	Horstmann	Infants, [Berlin?]	1–20d.		40	8 20.	4 10.	....	(Atropine) 28 70.	
66	"	Dennett	Pupils of various schools, Hyde Park	4–20	1133		854 75.3	95 8.4	133 11.7	(133 11.7)	
67	"	Beheim-Schwarzbach	Pupils of various schools, Australia	8–17	3367		....	268 7.9			
68	"	" "	Maori children, Australia	10–15	104		15 14.4	3 2.9	86 82.6		
69	"	Emmert	Gymnasium pupils, Berne	6–18	203	406	36 8.9	52 12.8	318 78.3		
70	"	Florschütz	Pupils of var. schools (1873), Coburg	6–20	2041		1329 65.1	[800 eyes] 434 21.3	72 3.5		
	"	"	Pupils of var. schools (1877), Coburg	6–20	2323		....	341 14.7			
71	"	Herzenstein	Military Gymnasium pupils, Orel	6–14	472		242 51.2	69 14.6	?	161 34.1	
72	"	Schillbach	Gymnasium pupils, Jena	....	[206]		....	212 66.6			
73	"	Netoliczka (vide 82)	Pupils of primary schools, etc., Graz	....	....		....	21.6—66.6			
74	1881	Königstein	Infants (newborn), Vienna	<10d.	281	562	10 2.	0 0.	....	552 98.	
75	"	Cohn	Medical students, Breslau	....	108	216	81 37.5	116 54.4	19 8.8		
76	"	v. Reuss	Common school pupils, Vienna	6–14	472		242 51.2	69 14.6	161 34.1		
77	"	Weber	Higher schools, Darmstadt	9–21	1389	2778	1176? 42.?	951 31.2?	232 8.3	324+	
78	"	Risley	Pupils of various schools, Philadelphia	6–21	1212	2422	272 11.2	332 13.7	....	1792 74.1	As. (1330)
79	"	Badal	Deaf-mute pupils, Bordeaux	....	200		....	15 7.5	24 12.(+)		
80	"	Collard	University students, Utrecht	17–38	410	820	389 47.4	286 35.	158 19.2	....	As. (105)
81	"	Westphal	Gymnasium pupils, Schleiz	11–21	149	298	133 44.6	149 50.	16 5.3	....	As. 70
82	"	Netoliczka	Realschule pupils, Graz	....	254		136 53.5	75 29.5	35 13 8		
	"	"	Pupils of primary schools, Graz, etc.	....	4934		....	493 10.			
	"	"	Pupils of Grammar schools, etc., Graz.	....	569		....	134 23.3			
	"	"	Pupils of Realsch. & Gymnasia, Graz.	....	1225		....	376 30.7			
83	"	Reich	Military Gymnasium pupils, Tiflis	....	246		?	[10.9—70.]	?	?	
84	1882	Fox	American Indian pupils, Carlisle	8–22	250		237 94.8	6 2.4	4 1.6		
85	"	Paulsen	Pupils of navigation school	....	76	152	119 78.25	19 12.5	14 9.25		

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[1] The percentages foot up 102 per cent.

No.	Date.	Examiner.	Character of examined.	Age.	Persons.	Eyes.	Em. per ct.	M. per ct.	H.m. per ct.	H. per ct.	As. and Amb.
86	1882	Borthen	Pupils of various schools, Throndjem	6–19	550		247=44.9	96=17.5	206=36.4		
87	"	Schubert[1]	Pupils of common school, Nuremberg	....	1012	1830	626=34.2	505=27.6	699=38.2	?	Amb. 74
88	"	Roberts	Pupils of var. schools, Buenos Ayres.	....	6163		....	260 4.22			
89	"	Erismann[2]	School children (1876), St. Petersburg	....		350	?	54.[+]	15[+]		
90	"	Mittendorf & Derby, R. H.	Primary pupils, New York	....	203		[162 80]	6 3.	35 17.		
	"	" " "	Grammar pupils, New York	....	698		[555 79.5]	[59] 8.5	[84] 12.		
	"	" " "	Grammar pupils, New York	....	896		....	119 13.5			
	"	" " "	College students, New York	....	201		....	69 35	[20] 10.		
91	1883	Nordenson[3]	Pupils of Alsatian school, Paris	7–20	226	452	(319 70 5)	70 15.5	63 13.9	......	As. 411
92	"	Manz	Gymnasium pupils, Freiburg	....	487		....	141 29.			
	"	"	Grammar pupils, Freiburg	....	[883]		....	126 14.2			
	"	"	Pupils of various schools, Freiburg	....	3982		....	452 11.			
93	"	Berlin and Rembold	Orphanage scholars, Stuttgart	7–15	282	564	....	103 18.			
	"	" " "	Real-Gymnasium pupils, Stuttgart	....	....		....	41.7			
	"	" " "	Gymnasium pupils, Stuttgart	....	....		....	45.7			
94	"	Gaertner	Theological graduates, Tübingen	±19	575	1150	283 24.6	865 75.2	2 0.17		
95	"	Derby, Hasket	College graduates, Amherst	21–26	254		87 34.3	120 47.2	47 18.5		
96	"	Dobrowolsky	High school pupils, Ural	....	212		....	[26] 12.0			
97	"	Dürr	Lyceum pupils, Hanover	[9–19]	345		46 13.3(?)	121 35.(?)	107 33.6	(Homatropia) 192 60.4	
	"	"	Seminary students, Hanover	[16–20]	96		9 9.37	32 33.3	36 37.5	(Homatropia) 55 57.3	
98	"	"	Real-Gymnasium pupils, Hanover	[9–19]	271		....	81 30 4			
99	"	Hansen	Country school pupils, Kiel	10–14	808	1610	26 1.58	51 3.4	....	(Homatropia) 1522 94.12	Amb. 6
100	"	Reich	Girls' institute pupils, Tiflis	....	173		40 23.1	57 33.	63 36.4	......	As. 13
	"	"	Infantry school pupils, Tiflis	....	292		....	52 17.8			
	"	"	Military gymnasium pupils, Tiflis	....	252		61 24.2	49 19.4	129 51.2	......	As. 10
101	"	Motais	Type-setters, Paris	....	97		10 10.3	31 31.9	....	21 21.6	As. 30
102	"	Schtschepotjeff	Middle school pupils, Astrachan	....	600		[482] 80.33	[99] 16.5	[17] 2.83	......	As. [3]
103	"	Schadow	Primary scholars, Island of Borkum	6–14	146	292	44 15.1	2 0.7	....	240 82.2	
104	"	Hadlow	Naval training sch'l pupils, Greenwich	15	1074		....	60 5.8(?)			
105	"	Tscherning	Recruits (educated), Copenhagen, etc.	....	2336		(+2.— -2. 1825 78.12)	(>2. 420 18.)	....	(>+2. 91 3.9)	
	"	"	Recruits (uneducated), Copenhagen	....	5187		(+2.— -2. 4770 91.96)	(>2. 207 4.)	....	(>+2. 210 4.05)	
106	"	v. Reuss	Railway employés, clerks, etc., Vienna	....	273		150 54.94	86 31.50	37 13.55		
	"	"	" " engineers, etc., Vienna	....	280		188 67.14	11 3.92	81 28.93		
	"	"	" " trainmen, Vienna	....	421		307 72.92	25 5.93	89 21.13		
	"	"	" " stationmen, Vienna	....	554		376 67.87	30 5.41	148 26.71		
107	1884	Schleich	Infants (newborn), Tübingen	2h.–8d.	150	300	0 0.	0 0.	....	(Atropine) 300 100.	

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[1] Received too late for inclusion in summaries. [2] Re-examination, vide 14. [3] Corneal astigmatism was measured with the ophthalmometer of Javal & Schiötz.

No.	Date.	Examiner.	Character of examined.	Age.	Persons.	Eyes.	Em. per ct.	M. per ct.	H.m. per ct.	H. per ct.	As. and Amb.
108	1884	Schäfer	Deaf-mute pupils, Heidelberg	9–18	95		21=22.1	7= 7.3	41=43.1	62=65.2	
109	"	Seggel	Recruits (common soldiers), Munich	20–24	1526	3052	1425 46.7	347 11.4	1239 40.6	......	41
	"	"	Recruits (volunteers), Munich	20–24	284	568	128 22.5	341 60.	71 12.5	......	28
110	"	Ulrich	Infants (newborn), Königsberg	4h.–14d.	102	204	0 0.	0 0.	....	(Atropine) 204 100.	
111	"	Bjerrum	Infants (newborn)	7h.–14d.	87		23 26.5	3 3.4	....	(Atropine) 61 70.1	
112	"	Beselin [Becker]	Girls' school pupils, Heidelberg	8–18	250	500	(+1.— -1.) 348 69.6	(> 1.) 61 12.2	?	(>+1.) 75 15.	As 16
	"	"	Girls' school pupils, Heidelberg	5–18	369	738	(+1.— -1.) 482 65.3	(> 1.) 62 8.4	?	(>+1.) 154 20.8	As 40
113	"	Kotelman	Kalmucks, Hamburg	15–35	17	34	9 26.5	0 0.	25 73.5		
114	"	Seggel	Soldiers (militia), Munich	....	1118	2236	....	[1180 52.7]			
	"	"	Military cadets, Munich	....	350	700	....	[176 25.1]			
	"	"	Gymnasium pupils, Munich	....	208	416	....	[208 50.]			
	"	"	Girls, boarding school pupils, Munich	....	174	348	....	[141 40.5]			
115	"	Horstmann	Infants (newborn), [Berlin]	7–21d.	50	100	10 10.	6 2.	....	(Atropine) 88 88.	
	"	"	Young children, [Berlin]	1–2y.	50	100	10 10.	6 6.	....	(Atropine) 84 84.	
	"	"	Young children, [Berlin]	4–5y.	50	100	13 13.	13 13.	....	(Atropine) 74 74.	
116	"	Fox	Indian girls, pupils, [Carlisle]	....	60	110	36 32.7	13 11.8	....	48 43.6	6
117	"	Van Anrooy	University students, Leyden	17–33	470	939	527 56.23	291 31.	114 12.15	......	Mix. As. 5
118	"	Del Carlo & Pardini[1]	Municipal scholars, Lucca	6–16	266	532	(V=1. 224)	142 26.7	7 1.2		
119	"	Scellingo	Boys, elementary scholars, Rome	5–10	76	152	(73)	6 4.—	5 0.		
	"	"	Boys, municipal scholars, Rome	6–15	350	700	(515)	91 13.	10 1.4		
	"	"	Girls, municipal scholars, Rome	6–13	220	440	(295)	67 15.2	30 7.		
120	"	Masini	Boys, municipal scholars, Sienna	7–15	352	704	(422)	81 11.5	2 0.3		
	"	"	Boys, mun. scholars, Castelfiorentino	7–12	102	204	(168)	16 7.8	2 1.		
	"	"	Boys, elementary scholars, Certaldo	7–14	148	296	(221)	19 6.4	0 0.		
121	"	Moyne	Girls, element. etc., Naples, etc.	3–30	722	1444	(1133)	190 13.1	14 1.		
	"	"	Boys, element. etc., Naples, etc.	6–22	1037	2074	(1752)	226 10.9	7 0.3		
	"	"	Boys, Lyceum, etc., Naples, etc.	7–19	415	830	(660)	131 15.8	1 0.1		
122	"	Brignoni	Girls, elementary scholars, Trapani	8–15	156	312	(226)	57 15.+	2 0.6		
	"	"	Boys, elementary scholars, Trapani	6–17	389	778	(575)	95 12.2	0 0.		
123	"	Hoffmann, A.[2]	Lyceum pupils, Strassburg	9–20	517		246 47.4	190 36.6	....	(81 15.6)?	
124	1885	Schleich	Upper Gymnasium pupils, Tübingen	14–18	60	120	16 13.3	86 71.6	....	14 11.6	
125	"	Randall	Medical students, Philadelphia	19–34	90	180	32 18.8	17 9.44	(37 26.)	131 72.77	

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[1] In this group of Italian investigations the optometer of Moyne seems to have been used, and note made of only the absolute H. if any.

[2] The H. was measured with the ophthalmoscope, whether it was sought with this means among the apparent Em. does not appear.

Let us now see how far the methods above sketched have been applied in the investigations which have been made; what results, positive and negative, have been obtained; and how far we can formulate corrections for such as are incomplete, and by their application bring also the inferential results to the elucidation of our subject:[1]—

Beginning our study of the data given in the preceding tables by a summing up of all that can be employed on the subject of the frequency of *Myopia*, we find that we have available records of 115 investigations or groups of investigations:—

Of 146,522 examinations (individuals or eyes) M. 28,483 = 19.44 p. c.

Separating, now, those investigations giving us data as to all conditions of refraction, we have as the result of 88 investigations or groups of studies:—

90,886 exam.: Em. 43,174 = 47.73 p. c., M. 19,750 = 21.87 p. c., H. 25,635 = 28.46 p. c.

In not a few of these cases the M. designates only *apparent myopia*, the Em. comprises all with normal vision, or at best those without *manifest* ametropia;[2] while under H. are included, for the most part, only the *H. manifest*—the cases where the *H. total* was sought being about counterbalanced by those in which only the *H. absolute* is given. Turning now to that series of studies in which *H. total* was sought and noted with care sufficient to obtain some approximation to it, and to exclude from M. the cases of spasm of accommodation simulating that anomaly, we gain the following results from 27 studies:—

16,160 examinations: Em. 3297 = 20.40 p. c., M. 2918 = 18.01 p. c., H. 9717 = 60.13 p. c.

This is excluding Erismann's 1889 = 43.3 per cent. H. m., Emmert's 3308 = 77 per cent. H. m., Pflüger's 800 = 44 per cent. H. m., Seggel's 1239 = 40.6 per cent. H. m., and many others with even higher percentages of H. m. It is also exclusive of Just's work, since the 1660 = 67. per cent. *non-myopic* eyes, although "almost all" hypermetropic are not with sufficient clearness stated to have been H.; and Weber's, Tscherning's, and Beselin's work, although doubtless accurately done, is excluded for lack of full data as to the results obtained.

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[1] Lack of space excludes the detailed accounts of the methods and results of the individual investigations which were prepared to form the body of this paper: so also as to the tables of curves which would in some measure have supplied their place as to class-results, etc. The school totals are given in the tabulation which follows. Under Em. are included all not proven ametropic; under M. all whose apparent myopia was not shown to be fictitious; under H. m. all cases of hypermetropia manifest, whether absolute, facultative, or relative; and under H. all, where any attempt seems to have been made to discover the total hypermetropia, as well as those where the methods employed are not given. Astigmatic eyes are included under H. and M. respectively, when recorded as H. As. or M. As.; under As. when not so specified.

[2] Gardner found among 1082 pupils of Springfield, Mass., 81 = 7.5 p. c. M., 291 = 26.9 p. c. H. m. and 69 = 6.35 As. Report of School Committee, 1884.

Combining the cases where we obtain data as to the relations of *normal vision, apparent* Em. (*i. e.*, absence of H. m.), and Em. probably such, we find:—

5347 examinations: V=1. 4362=81.58 p. c., App. Em. 2578=48.21 p. c., Em. 147=27.51 p. c.

although among the Em. here noted, are still many not adequately tested, if at all, for latent H.

A similar comparison as to H. abs., H. m., and H. (generally ophthalmoscopically determined) gives:—

1378 examinations: H. abs. 59=4.29 p. c., H. m. 784=56.9 p. c., H. 1031=74.8 p. c.

while in—

9344 examinations: App. Em. 4383=47. p. c., Em. 1742=18.6 p. c., H. m. 2076=22.2 p. c., H. 5284=56.5 p. c.

if we include Just's work, as well as others more definite. In 6873 examinations where App. M. constituted 1911 = 27.8 per cent., these figures were reduced to 1415 = 20.6 per cent. by measures calculated to eliminate more or less completely the accommodative spasm. Similar comparisons could be made on many points; but this is sufficient to show the direction and extent of the corrections which would have to be applied to many of the studies before us in order to approximate accurate results. The actual application of such corrections can hardly be profitably made, except to very extensive summaries, and even then with great reserve; yet we will probably be fully justified in claiming that, among the whole number thus far examined, more than 145,000 in all, not more than 20,000, or 14 per cent., were actually myopic. Similarly, of about 90,000 examined as to the relative frequency of the various conditions of refraction, some 22,000 were approximately Em. (25 per cent.), 13,000 M. (14 per cent.), 30,000 H. m. (33 per cent.), and 55,000 H. (60 per cent.).[1]

Leaving this field of conjecture, and turning to the data showing the refraction at various ages, we will first study the question of the refraction of the new-born infant. Eight investigations are on record:—

		Infants.	Eyes.	Em.			M.			H.		
1861.	v. Jaeger,	(100+)	100	5=	5	p. c.	78=	78	p. c.	17=	17	p. c.
1880.	Ely,	111	154	21	14	“	27	18	“	106	69	“
“	Horstmann,	20	40	8	20	“	4	10	“	28	70	“
1881.	Königstein,	281	562	10	2	“	0	0	“	552	98.2	“
1884.	Schleich,	150	300	0	0	“	0	0	“	300	100	“
“	Ulrich,	102	204	0	0	“	0	0	“	204	100	“
“	Bjerrum,	87	(87)	23	26.4	“	3	3.4	“	61	70.1	“
“	Horstmann,	50	100	10	10	“	2	2	“	88	88	“
		901+	1547	77=	5	p. c.	114=	7.3	p. c.	1356=	87.6	p. c.

All authorities are agreed that *full paralysis of the accommodation* by a mydriatic is an absolute essential in this difficult field of investigation; and we must accept Horstmann's statement that this is attainable with difficulty, even when employing a solution of atropiæ sulph. 1:100. Jaeger's work, done in the earliest days of the ophthalmoscope, probably lacked that exquisite skill in the use of the instrument which later distinguished this master of ophthalmoscopy; and, further, was done without employment—certainly without the complete employment—of a mydriatic. His parallel work in the study of the dimensions of 70 eyes of infants after death, showed no instance of axial myopia; and the later studies force us to decide against his assumption of an undeveloped suspensory ligament or of a usual forward displacement of the lens, causing a *temporary* myopia of the new-born—a view negatived also by the rest of his examinations of the eyes of older children. We must, therefore, exclude Jaeger's study (albeit with much hesitation) as incompetent evidence in the matter before us. The need of "full paralysis of accommodation" leaves room for questioning of the results obtained by weak mydriatic solutions, since Horstmann failed in at least 7 instances to secure even full dilatation of the pupil with 1 per cent. solution of atropine repeatedly used. Bjerrum's finding of 23 Em. and 3 M. after (a single?) employment of atropine (0.25 per cent. solution) cannot be considered conclusive; and Ely's results of 17 per cent. Em. and 11 per cent. M. among 105 eyes under the influence of a solution (gr. ij ad f℥j) of atropine, and 8.2 per cent. Em. and 32.6 per cent. M. among 49 eyes under a weak atropine solution (gr. j ad Oj) must be similarly viewed. Accepting them conditionally, however, and doubling Bjerrum's figures to obtain the number of eyes studied by him (a procedure apparently justifiable), we gain as the result of these studies, exclusive of v. Jaeger's:—

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[1] Study of the degree of refraction error, of anisometropia and of many other points of cardinal importance must be reserved for a later paper.

Of 1534 eyes of infants, Em. 95 = 6.19 p. c., M. 39 = 2.54 p. c., H. 1400 = 91.26 p. c.

Only the 6 myopic eyes of Horstmann's two studies can be considered as well-established cases of M.; yet the success of Königstein and Ulrich with atropine (0.1 per cent.), and of Schleich with 0.5 per cent., in doing away with all apparent M. in their studies, lends confirmation to other results where weak mydriatic solutions were employed.

Passing on to the consideration of the refraction of children more developed, but not yet of school-age, we find, exclusive of v. Jaeger's work, only four investigations.

	Eyes.	Em.	p. c.	M.	p. c.	H.	p. c.
Koppe, Kindergarten pupils, 30	60	1 =	1.7	0 =	0	59 =	98.3
Horstmann, children:							
(8–24 months), 57	96	13	13.5	9	9.4	74	77
(1–2 years), 50	100	10	10.10	6	6	84	84
(4–5 years), 50	100	13	13	13	13	74	74
Total children (8 m.–5 yrs.), 187	356	37 =	10.4	28 =	7.86	291 =	81.75

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[1] Koppe's results in the Kindergarten are impeached by himself, since he may have been measuring his own hypermetropia and not that of the observed eye. All but 18

Proceeding now to the other end of the scale of life, we find the one study of Cohn on the eyes of aged persons, mountaineer villagers in Silesia:—

100 persons (60–84 years), 200 eyes, Em. 49 = 24.5 p. c., M. 25 = 12.5 p. c., H. (m.) 114 = 57 p. c. ? 12 = 6 p. c.

A study of much interest, but of insufficient extent to be conclusive, while the individuals tested were within the region of the "hypermetropia aquisita," and of myopia due to the cataractous swelling of the lens, the "second sight" of common parlance. The other investigations of the eyes of adults have generally more bearing upon the question of the ophthalmic hygiene of various handicrafts than upon our subject, until we reach the investigations of the eyes of recruits, almost invariably young men from 20 to 24 years of age. Considering only the common soldier, whose eyes have been subjected to primary school-work alone, examinations as to visual acuity have been extensive and interesting. Thus Herzenstein found among 27,682 men of various arms, binocular vision above normal with Junge's test-types in from 71.6 per cent. to 76.6 per cent. of various garrisons about Orel and Cracow; while Rumschewitsch among 9882 recruits in the Kiew district, found 70 per cent. with $V. = \frac{120}{\text{XL}}$ to $\frac{60}{\text{XL}}$, 26.4 per cent. with $\frac{60}{\text{XL}}$ to $\frac{40}{\text{XL}}$, 4 per cent. with $V. = \frac{20}{\text{XL}}$ to $\frac{40}{\text{XL}}$, and 0.6 with $V \frac{1}{\text{XL}}$ to $\frac{20}{\text{XL}}$.[1] The examinations bearing more strictly upon the refraction are numerous, but rarely of both convincing accuracy and fulness.[2] Seggel's study of the common soldiers of the Munich garrison is about the only one fully competent in its testimony, and from its extent it can well stand alone.

1526 common soldiers, 3052 eyes, Em. 1425 = 46.7 p. c., M. 347 = 11.4 p. c., H. m. 1239 = 40.6 p. c., Amb. 41.

Allowance must, of course, be made for the cases with latent H. among those noted as Em. in order to approximate full accuracy; a correction which cannot, however, be accurately formulated.

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eyes, however, appeared H. > 1. D., the amount which he estimates that he manifested in this investigation, and only 2, including the 1 Em., were H < 1. D.

The Kindergarten and El. pupils were examined by the ophthalmoscope alone. In the other schools he obtained (counting As. with M. and H.):—

by glasses,	989 pupils,	Em. 219 = 22.1 p. c.	M. 269 = 27.8	H. m.	501 = 50.7 p. c.
by ophthal.	1059 "	" 188 = 17.7 "	M. 240 = 22.6	H.	606 = 57.2 "
by oph. and gl.,	1059 "	" 112 = 10.6 "	M. 220 = 20.8	H.	711 = 67.1 "

[1] The question as to the illumination under which these results were obtained is all-important; yet many investigators are strangely silent in this regard. In sunlight $\frac{120}{\text{XL}}$ would indicate no sharper vision than $\frac{20}{\text{XV}}$ in a well-lighted room.

[2] Ljubinsky is cited (Nagel's Jahresbrt. xiv. p. 195) as having found, among 7312 sailors, Em. 48.7 p. c., M. 28 p. c., H. 43.1 p. c., and As. 2.2 p. c. (120. p. c.).

Of the data that remain all are complicated by the question of "school myopia," into which it is impossible here to enter. The persons examined were pupils of schools of every grade, generally fully engaged with their school-work, and showing at once the temporary and the permanent marks of its effect upon their eyes. Yet much information can be obtained from their study, and we will proceed to a rapid review of the refraction in the schools of various grades.

Summing up, as before, the results of the twenty-six investigations as to myopia, we learn that in 23,315 examinations 1582 = 6.79 per cent. M. were found. A discrimination between the real and the apparent M. in these results would lower somewhat the M. percentage, although the figures of the first two studies on the list contain no myopes below 1. D. in grade, and the last study, only those greater than 1. D.

Passing to the other conditions of refraction we find—

In 22 investigations 13,929 examinations : Em. 857 = 63.59 p. c., M. 1582 = 11.36 p. c. H. 3764 = 27.04 p. c.
" 10 " 3,358 " Em. 491 = 14.62 p. c., M. 137 = 4.08 p. c. H. 2564 = 76.06 p. c.

In the second series are placed those studies in which the H. t. was sought, although in Beselin's work only the H. > 1. D. is reported, and here are also included Just's results, although not entirely definite in their statement—any error in the one being probably neutralized by the other. From five investigations, exclusive of Just's, we obtain :—

1835 examinations : App. Em. 767 = 41.79 p. c., Em. 371 = 20.22 p. c., App. M. 126 = 6.86 p. c., M. 58 = 3.16 p. c., H. m. 970 = 52.86 p. c., H. 1368 = 74.55 p. c.

These figures comprehend the results of Cohn's study in the mountain village of Schreiberhau, in Silesia, when atropine (in substance) was employed in most of the eyes. As various critics take diverse views of the question of the refraction under mydriatics, a few remarks upon the subject seem in place. Donders's definition of refraction fittingly opens the subject : "By *refraction of the eye*, we understand its refraction in a state of rest; that is, the refraction which the eye possesses in virtue of its form and of that of its component parts, independently of muscular action, independently of accommodation. The term, therefore, applies to the refraction of the eye whose muscles of accommodation are inactive or paralyzed (*for example under the influence of atropia*), to the refraction also of the dead but as yet otherwise unaltered eye."[1] In discussing emmetropia, however, Donders assumes a "*tone of accommodation*" which can be done away only by a mydriatic, and concludes with the often-quoted expression : "Consequently, the actually emmetropic vision requires in a certain sense a minimum of H., and that minimum is capable of no accurate taxation, because to the tone itself a certain latitude, perhaps from $\frac{1}{100}$ to $\frac{1}{40}$, must be allowed." Whether his view on this point remains unchanged we do

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[1] Donders, Accommodation and Refraction of the Eye, p. 80. (Italics ours.)

Elementary Schools, etc.

Examiner.	Examined.	Age.	Pupils.	Eyes.	Em.	per ct.	M.	per ct.	Hm.	per ct.	H.	per ct.	
Cohn . . .	Country Primary . .	6–13	1486	......	1408=	94.7	22=	1.4	16=	1.1	....		M. > 1. D.
Cohn . . .	City Elementary . .	6–14	4978	......	4245	85.3	334	6.7	127	2.5	....		M. > 1. D.
Erismann . .	City Preparatory . .	......	59	......	11	18.6	8	13.6	40	67.8			
Cohn . . .	Village Primary . .	6–13	(240)	480	14	3.	4	0.9	370	77.	438=	91.2	Atropine.
v. Hoffmann . .	City Preparatory . .	6½–9½	249	......	147	59.	4	1.6	13	5.2	88	31.3	
Callan . . .	Negro Primary . .	6–13	270	......	18	6.6	2	0.84	213	78.9	250	92.	
Conrad . . .	City Preparatory . .	[6–9]	......	568	155	27.3	28	5.	101	17.6	383	67.4	
Spalding . .	City Primary . . .	6–10	1200(+)	.....	....		84	7.					
Pflüger . . .	City Primary . . .	7–10	808	......	383	84.9	27	3.35	409	50.6			
Emmert . . .	Elementary . . .	6–12	367	734	103	14.	32	4.86	596	81.2			
Loring & Derby .	City Primary . . .	6–12	......	410	348	84.9	28	6.8	34	8.3			
Koppe . . .	City Elementary . .	......	(103)	206	53	25.7	5	2.4	....		126	61.1	
Koppe . . .	City Preparatory . .	......	(136)	272	37	14.	20	7.5	173	70.	209	78.5	
Haenel . . .	City Primary (classes) .	......	682	1364	784	57.47	226	16.68	348	25.49			
Just . . .	City Primary . . .	......	(281)	562	(433 0?	77.)	59	10.5	59	10.5	[492	87.5]	
Smith . . .	City Board School . .	7–13	1636	......	....		86	5.3					
Netoliczka . .	City and Village Primary	......	4934	......	....		493	10.					
Dennett . . .	Village Primary . .	4–10	530	......	430	81.1	21	3.	58	10.9			
Florschütz . .	City Primary, 1873 . .	6–15	1476	......	1053	71.3	198	13.4	60	4.1			
Florschütz . .	City Primary, 1877 . .	[6–15]	1616	......	....		90	5.57					
v. Reuss . . .	City Primary . . .	6–11	257	......	129	40.4	29	11.2	99	37.1			
Risley . . .	City Primary . . .	5–12	(164)	328	23	7.01	13	4.	....		289	88.1	
Borthen . . .	Common	7–13	133	......	64	48.1	8	6.	61	45.8			
Mittendorf & Derby	City Primary . . .	......	203	......	[162	80.]	6	3.	35	17.			
Nordenson . .	City Primary . . .	7–13	79	......	61	77.2	5	6.3	13	15.2			
Schadow . .	Country Primary . .	6–14	(146)	192	44	15.1	2	0.7	....		240	82.	
Beselin . . .	City Primary . . .	5-9	131	......	70	53.4	4		....		49	37.4	{ Am. > 1, { Em.=+1.--1.

not know; but can hardly imagine so careful an observer to be still in error on this simple point. The question before us is whether this common residual tension is an *organic tonicity* or an *habitual action.* That no such "tone" is ascribed to the myopic eye is curious, if the first supposition holds good. Is there, then, in the eye, a tension of the accommodation which *cannot* be voluntarily relaxed? It may be confidently asserted that an emphatic negative will be given by *every observer who has carefully tested the matter.*

The assumption of such a "tone," like the hypothesis of *negative accommodation*—really another phase of the same question—lacks the first *positive* proof in its support. Negative evidence alone, cases of *habitual* spasm of the accommodation, can be adduced in its favor; and a single positive fact, did it stand alone, would scatter such support to the winds. The investigation before us fully answers the question, although its testimony has been generally overlooked. Cohn states: "*In 34 cases with H. m. in degree from* $\frac{1}{80}$ *to* $\frac{1}{12}$ *there was no slightest increase of the H. after atropinization.*" It may be remarked that *full paralysis* of accommodation was *proven* to have been attained in these cases, although in four others who remained apparently emmetropic, Acc. $= \frac{1}{15}, \frac{1}{24}, \frac{1}{40}$, and $\frac{1}{90}$, respectively, was found remaining. Similar proof, were any needed, would be found in the investigations of Roosa (53) and Dürr (98). How two opinions on the subject can exist is the only matter of surprise to the writer, who has in hundreds of cases given the *full correcting-glass* as determined under a mydriatic pushed to complete paralysis of accommodation (and seen it done in thousands), and has rarely seen it necessary to reduce the strength of the glass because of persisting recurrence of the habitual spasm.[1] His own low H., twice measured under full mydriatic paralysis, is entirely relaxed at will, and always taken into account in ophthalmoscopic measurements. The only noteworthy point, therefore, as to the admission of Cohn's atropine work in our present study, is that *especial weight* is to be given to its showings, since in it was employed a means of accuracy lacking in others.

The group of schools in which were found the results which have been given, practically represent the first three years of school-life; and it is from this point that the course of the German Gymnasium takes its start. Intermediate schools exist in Germany as well as elsewhere, but they differ as to the upper limit of their curriculum, and in the aims and the class of the pupils attending them, rather than in the age of their scholars. While the distinction between these and the gymnasia is, therefore, very important in its bearing on the question of school-myopia, to our investi-

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[1] The necessity, or, indeed, the advisability, of carrying this matter in practice to its extreme logical conclusion is a point which most ophthalmologists are by no means prepared to admit. Its *practicability* is the only question here raised, and is, in the writer's opinion, too fully demonstrated to need more extended proof.

Examiner.	Schools.	Age.	Persons.	Eyes.	Em. p.c.	M. p.c.	VIII.	VII.	VI.	V.	IV.	III.	II.	I.	Hm. p. c.	H. p. c.
Cohn........	Realschule,	10-22	1141		816=75.9	225=19.7	....	......	16= 9.	44=16.7	51=19.2	50=25.1	41=26.4	23=44.	} 41=1.9	
Cohn........	Gymnasia,	9-22	1195		866 72.5	314 26.2	....	......	31 12.5	41 18.2	52 23.7	73 31.	61 41.3	54 55.8		
Thilenius ...	Gymnasium,	....	314		175 55.7	96 30.6	....	......	11.	16.	33.	36.	40.	41.	9 2.9	
Schultz	Gymnasium,	....	431		......	159 36.9	1=14.3	16=26.2	10 15.4	22 36.7	13 26.	20 44.4	45 53.6	32 54.2		
Erismann ...	Various,	....	4239		1110 25.6	1284 29.7	....	124 15.8	197 22.4	262 30.7	228 38.4	206 41.3	157 42.	110 42.8	1825 43.	
Cohn........	Gymnasium,	6-22	361		187 52.	125 35.	....	5 13.	13 21.	14 27.	21 55.	33 52.4	27 60.	12 42.	25 7.	
Krüger......	Gymnasium,	9½-19	203	406	159 39.	162 40.	....	6.7	22.2	51.7	26.	37.5	55.	71.	......	83=20.6
v. Hoffmann.	Gymnasium,	9½-19	256	512	140 27.3	187 36.5	....	16 19.	28 23.7	21 28.4	22 32.	25 52.1	53 63.3	22 52.5	[10] 19.7]	171 33.8
v. Reuss	Gymnasium,	....	409	818	243 29.7	375 45.8	....	41.	49.	48.	40.	50.	61.	58.	158 19.3	[184]
v. Reuss	Gymnasium,	....	389		144 37.	166 42.7	....	37.	42.	46.	45.	55.	69.	75.	69 17.7	
Ott & Ritzmann	Gymnasium,	....	122	244	124 51.	96 39.3	....	.....	[15] 26.8	[25] 40.3	[16] 30.	[18] 47.	[14] 54.	[7] 58.	24 10.	?
Ott..........	Realschule,	12-14 ?	164	324	146 45.	37 11.1	....	14 8.5	19 14.5	4 12.9	......	......	......	......	122 37.7	?
Dor	Realschule,	10-19	430		279 64.9	125 29.	5 11.6	13 17.1	19 28.1	19 26.4	23 34 9	23 41.1	12 40.	11 58.	18 4.18	
Conrad......	Gymnasium,	9-20	1234	2468	754 30.55	650 26.34	....	......	36 8.7	54 14.3	81 18.6	200 34.	155 37.4	124 51.7	256 10.37	1058 42.9
Spalding	Grammar,	10-15	1000(+)		......	[160] 16.										
Pflüger......	Various,	11-23	1005		439 43.9	151 15.1	....	14 6.3	12 5.8	20 10.	22 14.4	26 26.6	23 34.5	34 67.	404 40.4	
Emmert.....	Various,	....	1781	3562	319 8.95	510 14.3	....	......	......	......	......	......	......	......	2712 76.1	
Loring & Derby......	Various,	....		1855	1183 63.8	420 22.6	....	......	......	......	......	......	......	......	252 13.6	?
Scheiding....	Latin classes	.. .	224	448	134 29.9	155 34.6	21 21.8	30 25.8	44 41.5	46 42.6	14 63.6	......	......	......	28 6.25	
Scheiding....	Gymn. "	....	199	298	53 17.8	216 72.5	....	......	......	......	56 59.6	57 75.	50 80.6	53 80.3	29 9.7	
Koppe.......	Gymn.	....	396	792	75 9.7	200 26.	....	18	14	32	31	41	33	31	328 44.2	502 64.5
Kotelmann..	Gymn.	8-21	413		240 58.	157 38.	....	......	14.7	22.	45.3	40.2	48.2	61.2	10 2.4	
Kotelmann..	Realschule,	....	232		......	[60] 26.	....	......	16	21.	32	29.	45.	45.		
Classen......	Realschule,	....	402		......	[166] 41.29	....	.....	29.	24.	40.	46.	71.	50.		
Becker	Gymnasium,	....	287		154 53.	>1. D.? 100 35.	....	......	4.	......	......	......	......	100.	......	>1. D ? 33 12.
Agnew [Cheatham]	College,	....	549	1097	651 59.	333 30.3	....	......	......	179 26.7	71 35.	35 30.7	30 60.	18 37.5	105 9.6	?
" [Prout & Mathewson]	Techn. Inst.	....	300	600	372 62.	79 12.5	....	......	......	......	......	......	......	......	126 21.	?
Derby, Hasket	Coll. Freshm.	....	122		......	36 29.5										
Derby.......	Coll. Freshm.	15-24	321		145 45.2	114 35.9	....	......	......	......	......	......	......	......	67 20.9	?
Niemann....	Gymnasium,	....	325	650	......	[318] 49.	....	......	23.	29.	39.	63.	58.	75.		
Niemann....	Paedagogium	....	388	776	......	[340] 44.	....	......	23.	27.	42.	47.	56.	70.		
Dor	Lyceum,	7-21		2032	1300 64.	568 28.	....	......	22 10.3	51 19.6	69 21.3	185 42.6	175 39.6	63 18.1	87 4.2	
Ott..........	Gymnasium,	....	120	240	90 37.5	98 40.8	....	......	......	......	......	......	......	......	52 21.6	?
———	Gymnasium,	....	177	354	[145 40.9]	209 59.3	....	......	......	......	......	......	55.	65.	?	
Haenel......	Gymnasium,	9-21	480	960	450 46.9	449 46.8	....	44 31.	59 33.7	83 47.9	75 48.1	46 54.8	89 62.2	53 68.8	54 5.62	
Haenel......	Kreuzschule,	9-21	554	1108	460 41.5	554 50.	....	24 29.6	47 35.1	73 47.4	78 51.3	72 46.7	152 61.5	108 60.7	86 7.76	
Haenel......	Realschule,	8-17	209	418	204 48.5	161 38.5	8 25.	23 25.8	73 56.1	28 31.1	13 26.	16 61.5	......	......	52 12.4	
Haenel......	Seminary,	13-21	218	436	164 37.6	23 53.9	....	......	49 47.6	57 57.	42 50.6	31 59.6	32 64.	25 56.8	32 7.6	

Examiner.	Schools.	Age.	Persons.	Eyes.	Em. p. c.	M. p. c.	VIII.	VII.	VI.	V.	IV.	III.	II.	I.	Hm. p. c.	H. p. c.
Haenel......	Seminary,	13–20	131	262	103=39.3	134=51.1	....	......	22=37.9	23=40.3	24=54.5	16=40.	21=80.8	28=77 7	24= 9.2	
Haenel	Secondary,	8–16	1035	2060	1028 49.9	612 29.7	76=25.2	139=24.4	109 22.8	156 36.2	132 39.5	......	......	......	420 20.4	
Just.........	Gymnasium,	....	194	388	(157 40.4)	195 50.3	....	......	26 37.1	23 32.8	21 39.	48 52.	38 76.	39 67.2	27 7.	[193=49.7]
Just.........	Realschule,	....	293	586	(264 45.)	266 45.4	....	......	23 28.	31 29.2	35 38·8	46 52.3	87 58.	44 62.	24 4.1	[296 54.6]
Kotelmann..	Gymnasium,	8–17	283	566	182 31.6	110 19.4	....	......	12 9.5	23 18.2	27 22.1	32 22.2	14 35.	2 25.	273 48.8	
Smith........	Normal Sch.	18–23	357		......	72 20.										
Dennett.....	Various,	10–19	603		421 70.3	74 12.3	....	......	......	23 9.8	19 10.5	18 16.5	10 19.6	3 33.3	76 12.6	?
Emmert.....	Gymnasium,	6–18	203	406	36 8.9	52 12.8	....	......	......	......	......	......	......	......	318 78.3	
Florschütz ..	Gymnasium,	9–20	177		72 40.7	91 51.4	....	......	24.2	37.	49.	69.7	12 85.7	7 77.	6 3.4	
Florschütz ..	Realschule,	10–18	260		122 47.	110 42.53	....	33.	33.3	47.5	37.5	55.5	62.	......	5 1 9	
Florschütz ..	" 1877,	....	290		......	101 34.8	....	......	......	......	......	......	19 65.5			
Florschütz ..	Gymn. 1877,	....	182		......	90 49.4	....	......	......	......	......	......	......	18 66.6		
Florschütz ..	Seminary,	17–20	44		......	16 36.4										
Herzenstein.	Mil. Gymn.	....	472		242 51.2	69 14.6	....	......	......	......	......	......	......	......	161 34.1	
Weber	Gymnasium,	....	509	1018	355 34.8(+	403 39.6(?	....	......	......	......	......	......	......	.....	72 7.07	[105 +]
Weber	Realschule,	....	354	708	250 35.3(+	245 34.6(?	....	......	......	......	......	......	......	......	50 7.06	[70 +]
Risley	Various,	9–21	1048	2094	249 11.4	319 15.2	....	......	......	......	......	......	......	......	......	1505 71.9
Westphal...	Gymnasium,	....	149	298	133 44.6	149 50.	....	......	11 32.	23 35.	27 54.	38 51.	28 54.	22 85.	16 5.3	
Netoliczka ..	Realschule,	....	254		136 53.5	75 29.5	....	15 26.8	7 16.3	8 21.	12 29.2	7 31.8	15 46.9	11 50.	35 13.8	
Netoliczka ..	" & Gymn.	....	1225		......	376 30.7	49	51	38	47	54	53	58	26		
Borthen.....	" & Gymn	....	417		183 43.9	88 21.1	....	......	......	......	......	......	......	......	147 35.2	
Mittendorf & Derby......	Grammar,	....	698		[162 80]	60 8.5	....	......	......	......	......	......	......	......	[84] 12.	
Mittendorf & Derby	Grammar,	....	896		......	119 13.5										
Mittendorf & Derby	College,	....	201		[111 55.]	69 35.	....	......	......	......	......	......	......	......	[20] 10.	
Nordenson...	Lyceum,	10–20	147		97 66?	32 21.8	....	2 8.3	3 13.	2 11.7	6 23.	4 23.5	5 25.	10 75.	18 12.2	
Manz........	Gymnasium,	....	[487]		......	141 29.	....	......	5 6.8	14 18.	13 16.	45 33.1	39 50.	25 54.3		
Manz........	Secondary,	....	[280]		......	52 18.5	7 11.	13 17.	11 19.	6 17.	11 36.	4 24.				
Manz........	Secondary,	....	[603]		......	74 12.2	0 0.	10 4.7	23 12.1	21 17.1	20 25.6					
Dobrowolsky	....	....	212		......	[23] 12.										
Dürr........	Lyceum,	[9–19]	318		25 7.86	101 31.7	....	9 15.5	12	8	11	22	33	23	107 33.6	Homatr'p 192 60.4
Dürr........	Seminary,	[16–20]	96		9 9.4	32 33.3	....	......	......	......	......	11	11	10	36 37.5	Homatr'p 55 57.3
Dürr........	Real-Gymn.	[9–19]	271		......	81 30.4	....	2 12.5	9 18.	8 16.	15 38.5	23 33.9	22 50.	2 22.2		
Hansen	....	10–14	808	1610	26 1.58	51 3.4	4 1.	11 3.	10 3.	10 3.9	16 6.	......	......	......	......	Homatr'p 1522 94.1
Reich	Girls' Inst.	....	173		40 23.1	57 33.	1 17.	......	......	......	......	53.	......	......	63 36.4	
Reich	Mil. Gymn.	....	252		61 24.2	49 19.4	6.7	......	......	......	......	......	......	60.	129 51.2	
Becker......	Grammar,	8–18	250	500	+1.- -1.D. 348 69 6	>1. D 61 12.2	....	......	......	......	......	......	......	......	......	>1. D. 75 15.
Beselin	Grammar,	8–18		607	+1.- -1.D. 412 67.9	>1. D. 58. 9.5	....	......	......	......	......	......	......	......	......	>1. D. 105 17.3
Hoffmann ...	Lyceum,	9–20	517		246 47.4	190 36.6	....	......	22 18.2	17 20.2	38 38.8	36 35.9	40 65.	35 67.3	?	81 15.6
Schleich.....	Upper Gymn.	14–18	60	120	16 13.3	86 71.6	....	......	......	......	......	......	......	......	......	14 11.6

gation it is hardly more than incidental. We will group these institutions, then, by the side of the so-called "higher schools," which aim at liberal education; only premising that we are dealing now with pupils between the fourth and the twelfth school year, or between about the ninth and the eighteenth years of life.

Combining the foregoing figures, we find as the result of examinations as to myopia in 50 gymnasiums and lyceums, 14 realschule, 7 seminaries, and about 50 other schools :—

In 55,342 examinations (individuals or eyes) 14,907 = 26.94 p. c. myopic.

Studying, now, those in which all conditions of refraction were sought, we obtain :—

In 42,763 exam. Em. 15,996 = 37.40 p. c., M. 11,757 = 27.49 p. c., H. 13,145 = 30.74 p. c., the H. probably here, as before, fairly representing the manifest hypermetropia, and the other figures the apparent myopia and apparent emmetropia, respectively. In the studies where the H. t. was sought, we find :—

In 9965 examinations Em. 2159 = 21.66 p. c., M. 2149 = 21.56 p. c., H. 5587 = 56. p. c.,

Here Just's results are again excluded, as well as those of Weber, of Becker, and of Beselin, where the figures given are confessedly incomplete and not available for our purpose; while Erismann's 1825 = 43 per cent. H. m., Pflüger's 404 = 40 per cent. H. m., Emmert's 2712 = 76.1 per cent. H. m., and Kotelmann's 273 = 48.8 per cent. H. m. are, of course, omitted. Studies of the relations of normal vision, apparent Em. and Em., of apparent M. and M., and of H. absolute, H. manifest and H. total, give results closely similar to those already set forth, and need not be here repeated in detail.

The data as to students of more advanced grade are limited, but doubtless worth summarizing :—

	Age.	Persons.	Eyes.	Em.	M.	H. m.
Cohn, Univ. of Breslau,	17–27	410		134=32.7 p. c.	244=59.5 p. c.	15=37. p. c.
Cohn, Medical students,		108	216	81 37.5 "	116 54. "	19 8.8 "
Gärtner, Theol. " Tübingen,	+19	713	1426	324 22.9 "	1096 76.9 "	2 0.2 "
Derby, H., Graduates, Amherst,	19–28	254		87 34.3 "	120 47.2 "	47 18.5 "
Collard, Univ. of Utrecht,	17–38	410	820	389 47.4 "	286 35. "	158 19.2 "
Van Anrooy, Univ. of Leyden,	17–38	470	939	527 56.23 "	291 31. "	114 12.15 "
Randall, Med. students, Phila.	19–34	71	142	51 18.8 "	54 10.5 "	37 26. "
	17–38	2436	4207	1593=37.86 p.c.	2207=52.46 p.c.	392=9.31 p. c.

In the first examination of this series H. abs. alone was noted; in the others the H. manifest was sought, but only in that of the writer, which ends the list, does the attempt seem to have been made to find the H. total by the ophthalmoscope or other means. In this last case the results were :—

71 Persons. 142 Eyes. Em. 30 = 21.1 p. c. M. 17 = 12.4 p. c. H. 93 = 65.5 p. c.

And for all—

90 Persons. 180 Eyes. Em. 32 18.8 p. c. M. 17 9.44 p. c. H. 131 72.77 p. c., figures in marked contrast to those above.

Looking backward over the long array of investigations which have been here grouped together, a few words of general comment seem permissible before passing to our conclusions. It is very evident that the majority of the studies cited can make no claim to being the unimpeachable foundation for our investigation of the refraction of the human eye; indeed few have been undertaken with the solution of any such question in view. The details of the methods employed in each examination would make clearer, perhaps, than is now the case, the true status and value of each; but lack of space excludes them, and the writer is unwillingly forced to group the studies and marshal their results as his study of the original data indicates is correct, and to set them forth apparently solely upon his own authority. Careful study of the original records will show, however, that the records have been in no instance classified, recast, or emended, arbitrarily; and if any judgment has been passed not fully upheld by the data furnished by each investigator, it has only been in holding as competent some of the investigations which are not *a priori* clearly self-condemned. In view of the great preponderance of the hypermetropic refraction in all investigations where its presence has been sought with a care in any degree adequate, it must be as evident to others as it is to the writer, that many of the studies giving low percentages in this matter cannot be correct. Such a conclusion, however, would by many be deemed a result of reasoning *a posteriori*, and has not been here drawn. For the figures given, unimpeachable accuracy cannot be claimed, especially when the sources from which they are derived are rarely free from palpable errors; and confusion and error are too easy of entrance to have been entirely excluded in the writer's own work. All that repeated careful revision and verification can do has been sedulously employed to secure correctness, and where possible the data have been submitted for verification to the investigators themselves, to many of whom the writer's thanks are therefore due.

It is then evident, that for the solution of the broader questions of the prevailing condition of refraction and other similar generalizations, few of the investigations thus far made are fully available; and it is to be hoped that future students of the subject will recognize these shortcomings and furnish us with fuller, broader, and more accurate data. The opportunities to employ mydriatics in extensive studies will continue to be very rare; it is therefore incumbent upon those who shall have such chances, if they would contribute fully to the elucidation of this important subject, to furnish at the same time data as complete as possible as to the vision without and with glasses, the accommodation and the apparent refraction, before the mydriatic, as well as the intraocular condition and the functional comfort of the eyes; and to furnish proof, where possible, that the mydriatic had been pushed to *full* paralysis of accommodation. Thus only can the strict requirements of the subject be met. For those who are debarred from the use of mydriatics, combination of all other methods of study is necessary, if they desire to render as slight as possible the doubt which must always attach to determinations of the refraction made in eyes with unparalyzed accommodation.

The following conclusions seem fully upheld by the results of the investigations thus far made:—

1. Myopia is almost unknown in infancy and very infrequent before the beginning of school-life. In the earlier school-years its percentage is still low and it is only in the advanced classes, especially of the German schools, that it ever attains to a preponderance. It has been found in not more than 39 = 2.54 per cent. of 1534 eyes of infants, in not more than 28 = 7.86 per cent. of 356 eyes of children under the school-age, and in only 1582 = 6.79 per cent. of 23,315 eyes of children examined during the first three school-years—figures which more accurate methods might have made lower. Among 3052 eyes of young men, upon whom the school influence had not been excessive, it was found in 347 = 11.4 per cent.—a percentage which probably oversteps the maximum which it is likely to attain outside of the schools.

2. Hypermetropia is the enormously preponderating condition in infancy and early childhood, and the first years of school life witness little reduction in its proportion. Outside of the schools it remains by far the most frequent refraction throughout life, and in the schools it is decreased by the change of eyes to the myopic refraction in a degree apparently varying according to the circumstances calling into existence that defect. It was found in 1400 = 91.26 per cent. of the 1534 eyes of infants examined, in 291 = 81.75 per cent. of the 356 eyes of young children, and in 2564 = 76. per cent. of the 3358 eyes of children in the elementary school years, among whom it was sought with adequate care. So also in the higher schools, it constituted at least 56 per cent. of the whole number of eyes studied by competent methods, being found in 5587 of the 9965 examined.

3. Astigmatism has been rarely sought with care, and the data with regard to its frequency are not sufficiently wide to justify definite conclusions. The findings of the studies where it has been well looked for, concur with the clinical work in indicating a measurable degree of astigmatism (0.5 D. or more) in the majority of ametropic eyes.

4. Emmetropia in a mathematically strict sense has probably no existence. Approximate emmetropia (Am. $< \pm 0.5$) is infrequent in all ages, probably at no epoch exceeding 10 per cent. Its apparent proportion is swollen by the array of eyes "*not proven*" ametropic, and we have but few studies where the accommodation has been with certainty set aside and its existence fairly well shown. Cohn among 299 atropinized eyes proved in no single instance its presence. Under homatropine Hansen found it in but 26 of 1610 eyes, and Dürr in 30 of 414 eyes: it consti-

tuted at most 60 = 2.6 per cent. of these 2323 eyes. Among the infants and young children 135 = 7.36 per cent. of the 1834 examined under atropine may have been emmetropic ; and Roosa's brief study indicates that it is probably as rare in adult life, even when perfect function apparently proves its presence.

5. The question of what is the *normal refraction* of the human eye is still an open one, and further material on the subject and closer study of the data in hand will be necessary before drawing conclusions as to it. Much light will be thrown upon the question by studies like Risley's of the relations of normal vision, intraocular health, and functional comfort, to the refraction. For the present the conclusion of this author, whose work stands almost alone, may be accepted. "The emmetropic is the model or standard eye—since emmetropia is shown not only to remain nearly constant in percentage throughout the school life, but that it is also the condition of health, and withal enjoys the highest acuity of vision and the greatest freedom from pain."[1] Yet hypermetropia is the prevailing—almost the exclusive—condition of the refraction among most animals, among children, among uncivilized peoples, and among all eyes uninjured by the educational process.

1806 CHESTNUT ST.

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[1] The great majority of the eyes having exceptionally acute vision are hypermetropic, but, as shown, the majority of all eyes are H.

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ARTICLE IX.

DEVIATION OF THE NASAL SEPTUM.

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ALTHOUGH the introduction of the laryngoscope nearly thirty years ago rapidly developed a new era in the diagnosis and treatment of diseases of the larynx, it is a much shorter time since greater attention is being paid by specialists to affections of the nose and its adjacent parts. The importance of rhinology cannot well be over-estimated when we consider the different functions the nose is performing in the human economy. The upper part of the nasal cavity, the olfactory region, presides over the sense of smell, whilst the lower one, the respiratory region, is the normal way for the air during the act of respiration. Interference with this natural channel leads to mouth-breathing with its manifold subsequent evils. When the air passes through the nose, it is not only cleansed and moistened, but it also reaches the lungs much warmer than when breathing is going on by the mouth. Nasal respiration with closed lips further exerts a negative pressure of two to four milligrammes mercury in the oral cavity,[2] by which the tongue is drawn to the hard palate, and the muscular action, maintaining the position of the lower maxilla, greatly assisted. The nose also acts the part of a resonant chamber for the human voice, and nasal obstruction imparts to it the so-called dead character described in Meyer's paper on adenoid vegetations. Finally, it is due to the anatomical relations of the nose to the eye and ear that cases of catarrhal conjunctivitis, lachrymal fistula, frequently only heal when coexisting nasal affections are relieved, and that the latter are, in an overwhelming number of instances, productive of aural disease often of the severest kind. Aside from the symptoms of nasal stenosis in a greater or less degree, deviations of the septum are apt to cause disfigurement of the face, and also have some relation to the bony structures of the head, which will be explained below.

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[1] The studies of Giraud-Teulon (Paris, Gaz. Hbd., p. 514, 1870), of Lopatin (Oljinski), of L. Zwingmann and of Buschbeck (Plauen, Vierteljrs. f. gericht. Med. u. öf. Sanitätsw. Jan. 1881), have been thus far inaccessible.

[2] Mezger and Donders, Pflüger's Archiv für Physiologie, vol. x. 1875, pp. 89–94.

Pathology.—Our subject has till of late been rather neglected by medical writers, and even some recent text-books do not treat it with the attention it deserves. The nasal septum is formed of an osseous, a cartilaginous, and a membranous part; the components of the osseous septum being the vomer, the perpendicular plate of the ethmoid bone, and the crista nasalis of the upper maxilla and of the palate bones. The deviations occur on the anterior two-thirds of the septum; the posterior part of the vomer has always been found straight, with the exception of a case of different diameters of the choanæ mentioned by Gruber.[1] Welcker[2] also saw a difference in height of the two choanæ 13 times in 37 skulls, with deflection of the nasal bones. Other anomalies of the vomer posteriorly, as *f. i.*, its vertical division in two halves (Lefferts); its extension backwards to the pharyngeal wall dividing the nasopharynx into two lateral halves (J. N. Madrenzie, Major) do not strictly belong to our chapter.

Deviations of the septum are so frequent that a perfectly straight septum is more the exception than the rule. Although they had been described over a century ago, Theile[3] was the first to publish statistics. He found in 117 crania 88 asymmetrical positions (73 per cent.), 41 deflections to the right, 45 to the left, twice a sigmoid-shaped inclination. Semeleder[4] saw, in 49 skulls, the septum bent to the left 20, to the right 15, sigmoid twisted 4 times (79 per cent.). Allen[5] met with narrowing of the left side 19, of the right 21 times in 58 skulls (69 per cent.), 6 of which exhibited contact between the superior and middle turbinated bones and the septum. Zuckerkandl's[6] examination of 370 crania showed 123 symmetrical and 140 asymmetrical positions of the septum; of the latter 57 inclinations to the right, 51 to the left, and 32 sigmoid shaped. Loewenberg's[7] proportion was 1 perfectly straight septum in 7 cases. The merit of having made the investigation of our subject on the largest scale and with the minutest accuracy is due to Mackenzie,[1] who examined 3102 skulls, 2152 of which had the septum sufficiently preserved to be tested. He found deviation in 1657 cases (76.9 per cent.), the average deflection being 4 millimetres; the greatest degree being 9, the least half a millimetre; septa with still lower curvature being counted straight. The inclination was towards the right side 609 (28.2 per cent.), to the left 838 (38.9 per cent.); sigmoid in character 205 times (9.5 per cent.); in 5 cases the septum was of "zigzag" type. The preponderance of the left side being the narrower one, although perhaps not as prevalent as generally assumed, is from the foregoing evident. The slight discrepancies of the investigators in regard to the percentage, probably resulted from the different methods adopted in determining the minor degrees of deviation. Europeans are generally more predisposed to the abnormity than other races, so Allen (*l. c.*) found in 93 skulls of negroes 21.5 per cent.; Zuckerkandl (*l. c.*) in 103 crania of non-European 23 per cent. deflection; whilst, according to Mackenzie (*l. c.*), of 438 symmetrical septa only 22.6 per cent. were from Europeans.

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[1] Gruber, W., Virchow's Archiv für Pathologische Anatomie, vol. lxx., 1877, p. 136.

[2] Welcker, H., Asymmetrien der Nase, in Beiträge zur Biologie, Stuttgart, Cotta, 1882, p. 323; also reprint.

[3] Theile, Zeitschrift für rationelle Medizin, 1855, neue Folge, vol. vi. p. 242.

[4] Semeleder, F., Die Rhinoscopie, Leipzig, Engelmann, 1862, p. 64.

[5] Allen, H., American Journal of the Medical Sciences, January, 1880, p. 70.

[6] Zuckerkandl, E., Anatomie der Nasenhöhle, etc., Wien, Braumüller, 1882, p. 45.

[7] Loewenberg, B., Archives of Otology, 1883, vol. xii. No. 1.

Curvature of the septum is often complicated with two anomalies, which, although not forming an essential part of it, are liable to aggregate already present mischief, and ought not to be lost sight of in the treatment. The first one is the presence of bony ridges, running along the septum and generally found on its convex side. When large and located at the lower part, they encroach upon the lower turbinated bone; when higher up, they press against the middle turbinated, obliterating the middle meatus and blockading the entrance to the antrum Highmori. The second anomaly has been described by Delavan[2] to consist in a hypertrophy of the middle turbinated bone in the otherwise spacious concave part of the nose, and occurring 11 times in 18 cases of deflection of the septum. This hypertrophy naturally interferes with the patency of the wider nostril, and the removal of the bone in such cases is advocated before operating upon the deflection.

The deviations thus far spoken of refer only to the osseous structure of the septum, but, as the cartilage alone is often bent, the percentage during life is still greater. Any or all parts of the septum can participate in the deflection, and there are cartilaginous, osseo-cartilaginous, and osseous deviations; the latter occurring in the perpendicular plate of the ethmoid bone, at the ethmo-vomerine suture, in the vomer and in the crest of the upper maxilla.

The configuration and location of the deformity have induced several writers to make different subdivisions, in which each one seemed to be guided more by his personal experience and observation than by a strict anatomical investigation on an uniform basis. Thus Loewenberg (*l. c.*) distinguishes horizontal, vertical, and irregular deviations, of which the first can again be superior and inferior. Ingals[1] divides the cases into four classes, whilst Mackenzie[2] enumerates six varieties for the cartilaginous part alone. In the opinion of the writer the most satisfactory explanation of the anatomical relations of septal deviations has been given by Welcker,[3] whose highly interesting studies, with the exception of one quotation in Mackenzie's Manual, could not be found alluded to in English treatises, and to which to refer at some length may for this reason be justifiable.

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[1] Mackenzie, M., Manual of Diseases of the Throat and Nose, London, Churchill, 1884, vol. ii. p. 432.

[2] Delavan, D. B., Archives of Laryngology, 1882, vol. iii. No. 3.

Welcker began his researches with the examination of his collection of 666 crania, which was supplemented by another of 78 plaster casts at the Institute for Comparative Anatomy at Leipzig. He made a selection of skulls, showing decided deflection of the nasal bones from the median line, and it became at once evident that two principal distinctions had to be made: one in which the cartilaginous part deviates in the opposite direction from the ridge of the nose (scoliotic noses graphically represented ·⟩·); the other in which both parts form one continuous oblique line (noses deviating in toto to one side, thus ·\·). The direction of the nasal bones, however, is no criterion for the deflection of the lower part and the tip of the nose, and the apertura pyriformis with its boundaries, especially the maxillar crest, is the deciding point. Welcker always found with but one exception a peculiar shape of this aperture in pronounced deviation of the nasal bones from the vertical line, and calls skulls with this abnormity *pteleorrhinal*, because resembling the shape of the elm leaf. The anomaly consists in asymmetry of the sides, one being wider horizontally and shorter in its vertical diameter; the other being narrower and longer vertically, lessening when excessive, proportionately the height of the palatine process of the upper maxilla. The salient feature is that the anterior edge of the vomer and the maxillar crest, both of which support the quadrangular cartilage, always deviate from the narrower and deeper cut-out side towards the wider and shallower side of the aperture. As further the deflection of the nasal bones coincides in different skulls, with the narrower as well as the wider side of the pyriform aperture, four main classes of deviations are to be distinguished. We, therefore, have skulls with I. deviation of the nasal bones to the left, and of the anterior edge of the vomer and the maxillar crest to the right; II. nasal bones, vomer edge, and crest to the right; III. nasal bones to the right, vomer edge and crest to the left; IV. nasal bones and crest to the left, number I. and III. representing scoliotic, II. and IV. *in toto* deviating noses.

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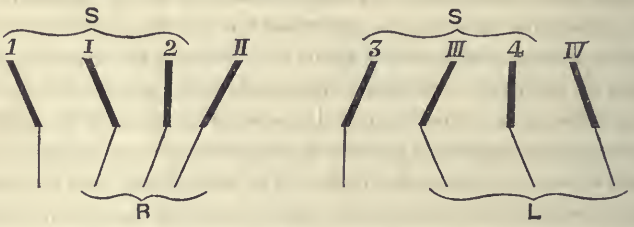
[1] Ingals, E. F., Archives of Laryngology, 1882, vol. iii. No. 4.

[2] Mackenzie, J. N., Deflection of the Nasal Septum, reprint from Transactions of Medical Society of Virginia, 1883.

[3] Welcker, H., l. c., pp. 337–349.

The deductions which Welcker drew from his investigation, and which he afterwards substantiated by his examination of casts, are summarized as follows: Asymmetry of the orbits often accompanies deflection of the nasal bones in the higher degrees of which the orbit is generally longer in its transverse diameter on the deflected side. Further, the plane of the pteleorrhinal aperture inclines from the median line of the skull towards the wider and shallower side of the aperture. All these skulls have a bent vomer, and its curvature is always found on the narrower, deeper side of the aperture, from which the above plane and with it the tip of the nose diverges. The same direction as stated above is taken by the anterior end of the maxillar crest and of the vomer because the latter will be inclined, *f. i.*, towards the right anteriorly when bent towards the left posteriorly.

It is obvious that there are many cases of septal deviation in which even painstaking scrutiny cannot detect deflection of the nasal bones from the median line. But from the accompanying schematic drawing it will not be difficult to show how such and other instances of deviation can be arranged under the four headings previously named—



The darker line represents the osseous ridge of the nose, whilst the lower finer line stands for the cartilaginous parts. The four Roman letters correspond, as is readily seen, to the four chief groups, the six forms under letter S are scoliotic noses, two of which in addition to the noses deviating *in toto* will have the tip turned to the right (R) or left (L) respectively. As numbers 1 and 3 are less frequent, also approach the configuration of I. and III., and as numbers 2 and 4 play only a subordinate part, we can in the main distinguish noses deviating I. to the left-right, II. to the right, III. to the right-left, IV. to the left. With this designation tallies the common usage with perhaps the one exception, that if the osseous part is strongly deflected, *f. i.*, to the left, but the tip only slightly to the right, the nose is generally called bent to the left, whilst here it is classified under number I. with deflection to the right.

In Welcker's examination of skulls only such presenting exquisite deviation of the nasal bones, 37 out of the whole number of 666 were selected, whilst in that of the plaster casts 44 out of 78, also such with minor degrees of deviation were made use of. As the writer could not find any corroboration of Welcker's researches in the literature the subject was considered of sufficient importance to test his assertions. The investigation, in which I had the valuable help of my assistant, Dr. Hubbard, had naturally to be made on a smaller scale, as the museums of our three universities contained only 268 skulls in sufficient state of preservation to be available for our purpose. Furthermore, the crania in the Museum of the University of the City of New York could not be removed from the glass cases on account of legal proceedings, and therefore not as carefully examined as was desirable. The result was that we found 20 skulls showing decided deflection of the nasal bones, which is a trifle higher percentage than Welcker's (7.0 to 5.5), and, to be short, that we could only verify his statements in every particular. In group I. we saw three, in group II. nine, in III. four, and in IV. four crania, corresponding in all details with the description in the foregoing pages.

Etiology.—In regard to the etiology opinions are divided up to the present time. Whilst formerly there was a tendency to consider almost all deviations congenital the opposite view seems now to gain ground (*f. i.*, Ziem, Bresgen). There can be but little doubt that acquired as well as congenital causes are important factors in the production of our disease. The latter must not be understood as causing a malformation of the septum present at the child's birth, but the different growths and development of the head in different individuals is the predisposing element for future deflections. The vertical diameter of the face of the new-born child is very short mainly on account of the small size of the upper maxilla, the height of which is about one inch.[1] The floor of the orbit lies directly above the alveolæ of the molar teeth, the antrum Highmori is represented by a small pouch on the anterior end of the middle nasal meatus, and does not form before the fourth month. The cribriform and perpendicular plates of the ethmoid bone are still cartilaginous; the latter begins to ossify towards the middle of the first year. The vomer is formed in the third month of intrauterine life by two ossifying plates, between which the original septal cartilage remains, often not disappearing before the thirtieth or fiftieth year.

According to experiments of Fick (see Heuke) who removed large pieces of the septum in animals, their snout grew in an upward direction, which shows that it had been kept down by pressure of the septum from above downwards. The nasal septum is destined to serve as a prop, pushing apart the upper maxilla from the base of the skull, and its growth will be greatly influenced by the maxillar palatine process, the shape of which again is in a measure dependent on the development of the Highmore's cavity. A high-pitched and narrow palatine arch naturally encroaches upon the growth of the septum in a vertical direction, and consequently often associates with septal deflection. The adherents of the view that all deviations are acquired (Ziem[1]) explains this observation by stating the primary cause to be in the septum and not in the palate. But it will be difficult to establish always a preceding lesion of the septum and to make it accountable for a subsequent abnormal palatine curvature. Furthermore, Jarvis[2] recently referred to this configuration as occurring in four members of one family, father and three sons, which tends to indicate a hereditary predisposition to this palatine anomaly with the accompanying septal deviation.

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[1] Heuke, W., Gerhard's Handbuch der Kinderkrankheiten, Tübingen, Laupp, 1877, vol. i. p. 250 *et seq*. See also Watson, Diseases of the Nose, pp. 22 and 23. London, 1875.

In this connection attention may be drawn to the investigation by Virchow of the development of the base of the skull.[3] He found a slight convexity upwards of the base in the new-born child, and calls it kyphosis of the base of the skull analogous to the curvatures of the spinal column. Marked kyphosis is complicated with diminished length of the cranial base and protrusion of the maxilla and teeth (Prognathy), whilst a straighter and longer base is associated with receding of the anterior part of the maxilla from the plane of the forehead and nose (Orthognathy). It is not impossible that orthognathy, which is prevalent in the Caucasian race, may bear some relation to the greater frequency of septal deviations in Europeans in comparison with prognathic races, and this supposition, although merely proffered as a hypothesis awaiting proof or denial by future researches, seems to be corroborated by the absence of nasal deflection in animals.

Congenital influence does not seem to develop septal deviation before the child arrives at a certain age. Zuckerkandl saw none before the seventh, Welcker none before the fourth year. Trauma is generally the cause of acquired deflection, and occurs already in early infant life, *f. i.*, injuries to the septum during difficult parturition. Blows, falls on the nose are very frequent, and often not remembered in later years. It is claimed by some writers that the habit of putting the fingers into the nose—by others, that the constant use of the pocket-handkerchief with one hand—bring on the deformity. Welcker (*l. c.*) propounds the theory that sleeping on one side accounts for nasal deflection to the other, which, conceded in regard to noses deviating *in toto* (see above number II. and IV.), gives no satisfactory explanation of the origin of scoliotic noses. Some deflections are due to tumors, fibrous polypi, etc.

Symptomatology.—Many cases of septal deviation, especially those of minor degrees, produce no symptoms whatever, whilst others cause not only an unsightly deformity, but are followed also by very annoying and sometimes grave consequences. Pronounced inclination of the nasal bones to one side interferes with the symmetrical aspect of the face, and in some instances also with the functions of the eye on account of the longer transverse diameter of the orbit. Anomalous curvature of the orbit determines anomalous curvature of the eye in its different meridians and astigmatism has been observed conjointly with asymmetry of the face.

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[1] Ziem, Monatsschrift für Ohrenheilkunde, etc. 1883, No. 4.

[2] Jarvis, Wm. C., New York Medical Record, March 14, 1885.

[3] Virchow, R., Untersuchungen über die Entwicklung des Schädelgrundes, p. 60 *et seq.* Berlin, Reimer, 1857.

The local symptoms are mainly those of nasal stenosis, including mouth-breathing, which have been so ably discussed by Roe,[1] Major,[2] and others, as not to necessitate a lengthy description here. Be it only briefly stated, that aside from almost always present nasal catarrh, all the functions of the nose alluded to are liable to become affected. The sense of smell may be diminished or lost entirely (already observed by Rupprecht, Aerztliche Intelligenzblatt, No. 14, 1867). Habitual mouth-breathing changes often not only the expression of the face, but causes also catarrhal affections of the pharynx and larynx, and in some cases is held accountable for development of pigeon-breast in children. The nasal twang of the voice has already been mentioned. As to the ear the whole array of symptoms from altered atmospheric pressure in the middle ear to otitis media with perforation of the tympanum and subsequent deafness can occur. Frontal headache, epiphora, even dropsy of the antrum have been observed, due to occlusion of the maxillar sinuses and the lachrymal duct.

Although at first sight it would appear that symptoms of nasal stenosis are less aggravated in septal deviations on account of greater patency of the opposite nostril, there are several elements interfering with free respiration through the latter. The law of compensation, which we notice in some organs, does not apply to the nose. The one nostril does not grow wider when the other is impermeable. Further, the greater patency of the unobstructed nostril is often the cause of catarrhal conditions in consequence of the feebler air-current and more difficult voluntary removal of secretion (J. N. Mackenzie). The frequent occurrence of hypertrophy of the middle turbinated bone on the wider side has already been referred to. Finally, sigmoid-shaped deviations may completely block up both nostrils.

Rhinoscopic examination will easily disclose the nature of the disease, although sometimes the diagnosis of polypi has erroneously been made. Thickening of the septum, simulating deflection, can, if not by ocular comparison of both sides, very well be determined by Seiler's[3] septometer, the index of which states the thickness of the tissue grasped between the calipers.

Treatment.—The devices for the relief of nasal deviation are so manifold and so well described by their different exponents, that a short statement

[1] Roe, J. O., New York Medical Record, April 30, 1881.

[2] Major, G. W., ibid., November 22, 1884.

Seiler, Carl, Diseases of the Throat, Philadelphia, Lea's Sons & Co., 1883, p. 83.

will suffice for our purpose. One of the oldest methods is the removal of the projecting part by the excising nasal forceps, one blade of which is introduced opposite the obstruction, and the forcep, when closed, acts like the ticket-punch of the railroad conductors. Blandin[1] introduced this operation, but did not publish the result of the case. Subsequent modifications of the instrument were described by Rupprecht,[2] Goodwillie,[3] Roberts,[4] and others. This proceeding answers in many cases, and gives relief to the patient by creating a passage of air through the nose, and is also to be considered when time is an object, as it is quickly performed. But it has some drawbacks, which must not be overlooked. Although the part excised is not large enough to deprive the nose of its support, the purposes of the septum are best observed by retaining its integrity. The wound is slow to heal, especially in scrofulous subjects, the nasal secretions collect and dry on its edges, and are apt to induce scabbing and soreness. When the opening is small, a whistling sound during respiration is audible, and last, the deformity of the face in scoliotic noses is not removed.

Demarquay[5] made an incision along the ridge of the nose, separated the mucous membrane from the prominent cartilage, cut the latter off, and united the edges of the mucous membrane, and then the outer wound with good result. Post[6] operated in a similar manner, but obtained access to the nasal cavity by dividing the side of the nose from the cheek. Wagner[7] employs Goodwillie's surgical dental engine, which moves revolving knives, saws, or trocars with a velocity of 2000 to 3000 revolutions per minute, and easily penetrates any desired tissue.

In contrast to these energetic measures is Michel's[8] proposal, who recommends his patients to rectify cartilaginous deviations by digital pressure against the opposite side fifty to one hundred times daily. As this has to be done for quite a long time few patients will be found willing to adopt it. The attempt to destroy the resiliency of the cartilage by a cutting or paring-off process has given rise to another series of operations. Dieffenbach[9] excised either an oval or a wedge-shaped piece of the cartilage, and united the cartilaginous with the membranous septum. Heylen[10] separated the mucous membrane from the cartilage in a patient twenty-one years of age, and cut the latter off with strong scissors. The parts were kept in position by insertion of a probe and strips of adhesive plaster until union was effected. The result was good. Chassaignac[1] operated in a similar manner, but pared off several slices of the redundant cartilage until he could bring it into the right position, and retained the parts in place by sponge tampons. Linhart[2] separates the cartilage on both sides from the mucous membrane before removing the deflected part. He lays stress on the complete preservation of the mucous membrane, which, he fears, is in danger to be cut away when the cartilage is denuded on the obstructed side only. Ingalls (*l. c.*) leaves the mucous membrane intact in the wider nostril and makes two incisions from above downward into the deviating cartilage representing an oval-shaped piece, which then is seized by its upper angle, drawn downward, and cut off. He as well as Linhart unites the mucous membrane by stitches. In all these operations the surgeon has to contend with working in a narrow field and with the blood interfering with his view.

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[1] Blandin, in Denonvillier's Compendium de Chirurgie pratique. Paris, Asselin, 1852–61, tom iii. p. 33.

[2] Rupprecht, L., Wiener Medizinische Wochenschrift, No. 72, 1868.

[3] Goodwillie, D. H., Transactions American Medical Association, 1880, p. 806, also reprint.

[4] Roberts, J. B., Medical News, March 18, 1882, also reprint.

[5] Demarquay, Gazette des Hôpitaux, 1859, p. 470.

[6] Post, A. C., New York Medical Journal, 1884, vol. xxxix. p. 388.

[7] Wagner, C., Diseases of the Nose, New York, Birmingham, 1884, p. 101 *et seq.*

[8] Michel, Die Krankheiten der Nasenhöhle, Berlin, Hirschwald, 1876, p. 29.

[9] Dieffenbach, J. F., die operative Chirurgie, Leipzig, Brockhaus, 1845, vol. i. p. 307.

[10] Heylen, M., Gazette médicale de Paris, 1847, p. 810.

Two other operations with the similar object to overcome the resiliency of the cartilage deserve mention. Jarvis[3] employs his snare with transfixion needles without perforating the septum, and Roberts[4] has of late devised an original method by which he makes a long incision through the cartilage in a direction downward and forward with a scalpel, this allowing him to push the whole cartilaginous septum into the median line. He then introduces a steel pin into the nostril, passes it completely through the anterior segment of the divided septum, carries its head to the opposite side and retains it there by imbedding its point deeply in the immovable part of the cartilaginous septum at the back of the naris. If necessary, a second pin will keep the tip of the nose straight.

The removal of the middle turbinated bone of the unobstructed nostril, before operating on the deflection, has been suggested by Delavan (*l. c.*), whilst J. N. Mackenzie (*l. c.*) snared off the lower turbinated on the deflected side with rapid improvement following the restoration of the breathing to its natural channel.

Scoliotic noses, osseous deviations, noses depressed by fracture, are best relieved by Adams's operation.[5] The instruments he uses are a strong forceps with flat parallel blades, a retentive apparatus in form of a steel-screw compressor, ivory plugs, and sometimes a nose-truss. After the bones are broken the compressor is worn three or four days, and then the plugs are inserted for two or more weeks. Modifications and improvements of the instrument were designed by Weir,[1] Jurasz,[2] Capart, the late Elsberg of this city, and others. Weir also relates an original method for straightening depressed and for elongating shortened noses. The blades of Jurasz's forceps are fastened to the handle by screws, and when released can be left in the nostrils as a retentive apparatus, thereby doing away with the necessity of removing the whole instrument and inserting a compressor. Capart (Brussels) releases the blades by springs, and Elsberg had them made strongly convex at the joint to prevent contusion of the membranous septum. The latter instrument is an excellent retentive apparatus and does not cause sloughing of the septum, a cause of complaint with other compressors, but is too weak to break osseous deviations. Finally an instrument has been published by Steele,[3] which consists of a forceps similar to that of Adams, on the inner surface of one of the blades of which are attached several cutting edges like narrow knife-blades perpendicular to the surface and crossing at a common centre $\frac{1}{8}$ to $\frac{3}{16}$ of an inch in height. The other blade is fused with copper and is introduced in the obstructed nostril opposite the point of greatest deflection. After closure of the instrument the cut edges will override and thus allow of the straightening. The plug he uses afterwards is self-retaining by an acute angle on its anterior corner, which, fitting into a little pocket or sulcus, existing just in front of the outer nasal opening, keeps it from protruding.

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[1] Chassaignac, E., Gazette des Hôpitaux, 1851, p. 420.

[2] Linhart, W., Compendium der Chirurgischen Operationslehre, Wien, Braumüller, 1862, p. 516.

[3] Jarvis, Wm. C., Archives of Laryngology, 1882, vol. iii. No. 4.

[4] Roberts, J. B., Philadelphia Polyclinic, October 15, 1884.

[5] Adams, Wm., British Medical Journal, October 2, 1875.

This instrument and the original Adams forceps with convexity of the blades near the joint, made for the writer by instrument-makers, Tiemann & Co., have given him the most satisfactory results in the treatment of septal deviations.

ARTICLE X.

A CASE OF PARALYSIS OF THE LOWER EXTREMITIES WITH HYPERTROPHY OF THE SKIN, SUBCUTANEOUS, AND MUSCULAR TISSUES.[4] By JOHN K. MITCHELL, M.D., Resident Physician in the Episcopal Hospital, Philadelphia.

MRS. C. H. S., æt. 50, born in New Hampshire, was admitted to the Infirmary for Nervous Diseases, November 12, 1883. Family history good, except that father died at the age of 67 of softening of the brain. Mother died of some affection of the liver. Grandparents on both sides unusually long-lived. An attack of bilious fever at 20 years old is the only previous illness of the patient herself, other than the diseases of childhood. She was married at 22, and has had two children by a first husband and three by a second; one child died young of diphtheria and one was still-born after a severe labor. Her last child is fifteen years of age. She has had three or four miscarriages early in term.

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[1] Weir, R. F., New York Medical Record, March 13, 1880.

[2] Jurasz, A., Berliner klinische Wochenschrift, No. 4, 1882.

[3] Steele, A. J., St. Louis Courier of Medicine, May, 1879.

[4] Read by request before the Neurological Society of Philadelphia February 23, 1885.

Her appearance as she lies in bed is that of a large, stout, bright-looking woman, not seeming so old as she is, with a fresh, clear complexion. She is and has always been very fat, and weighs now 226 pounds. About the upper part of the body there is nothing unusual to be noted. She moves her great bulk in bed by means of a strap attached to a gallows. Sometimes she finds her hands tire very soon of a continuous exertion, and she has now and then a pricking in the hands and forearms which annoys her. The circulation in the smaller superficial vessels is feeble, even for so fat a person. The organs in the chest are perfectly healthy; there is not a trace of congestion in the lungs in spite of her long supine position. Her urine is natural in color, quantity, and reaction, and shows nothing abnormal to any test or under the microscope. All her functions are naturally performed, and she is still menstruating.

Nearly the whole of the lumbar curve of the spine is deeply marked with the scars of old blisters, and for about four inches in the middle of the curve there is tenderness and pain on deep pressure.

It is some ten years since she first perceived any signs of failure in her legs; from her description it would seem to have been a lack of co-ordinating power at first. When she took active exercise, to which she was much averse, she was better. It was not until 1877 that her husband, himself a physician, realized the gravity of her trouble; at the time her legs were greatly hypertrophied, and have grown larger and larger ever since. She was then, however, still able to move about with slight assistance, although she had a continual dread of falling, and indeed did fall sometimes. During the summer of 1878 she was just able to get up and down stairs, and after some unusual exertion was finally obliged to take to her bed where she has ever since remained. In these five years the size of the legs has steadily increased, and their feebleness grown greater and greater, while at the same time there has been a gradual weakening of the muscles of the erector spinæ groups, so that an erect position has become almost impossible. There have been brief remissions when she was stronger and more able, and every sort and kind of treatment, medicinal, instrumental, and dietetic has been used, none with any better result than a slight and temporary improvement.

Both legs are enormously large, though this is scarcely remarkable considering the patient's weight. But the skin of the whole of both thighs, legs and feet is so hard and thick that it is impossible to pick or pinch it up anywhere, except by taking hold with the entire hand. It is *not tense* or *strained*, nor does it seem *stiff;* the feeling is exactly as if the skin had increased to five or six times its natural thickness. Through this leather-like tissue can be felt hard, brawny masses, unyielding to pressure, and although a little irregular in shape, occupying much the position of the natural muscular groups. The surface, as the touch perceives even through the skin, is not smooth and homogeneous, but has small depressions and elevations, and a more or less indented outline.

The left thigh is larger than the right. Midway between groin and knee is seated a rounded oblong swelling, irregular, as I have said, both in profile and in surface, lessening toward the groin and toward the knee rather suddenly into smaller like lumps, thus occupying the whole anterior aspect of the thigh.

The circumference of the middle of the thigh is the same as at the groin, 26 inches. On the right side is a swelling precisely like the one I have described, but not quite so large and distinctly harder. The inner side of each thigh presents a long, narrow, dense mass. Around the calf the right leg is a little larger than the left, and markedly harder, and both have in the place of the muscles of the calf hard and lumpy tissues beneath the thickened skin. The cutaneous thickening seems to diminish with the normal thickness of the skin, and to be less on the inner side of the thigh and leg, and over the dorsum of the foot and ankle. At the right ankle there is some œdema, so that the pit made by deep pressure with a finger had not entirely disappeared at the end of seven minutes. The muscles on the dorsal surface of both feet are dense and enlarged like the rest. There is evident venous stasis in both limbs and both are mottled with bluish patches of congestion. There is no subjective sensation of cold. The measurements of the lower extremities are as follows:—

	Right.	Left.
Groin	25 inches.	26 inches.
Mid-thigh	23¼	26
Around knee	20¼	18½
Below knee	15½	15½
Calf	15¾	15¼
Ankle	10¾	10¼
Arch of foot	10½	10½

Temperature.

	Right.	Left.
Upper part of thigh	96°	95⅘°
Lower part of thigh	92	96⅖
Calf	93⅗	98
Foot	92⅖	—

The right leg began to bend at the knee about five years ago and soon contracted as it now is, so that as Mrs. S. lies in bed the middle of the popliteal space is about five inches from the mattress. The joint can be forcibly straightened without causing pain. The only pain which she ever suffers in the legs appears occasionally in this knee; it is not severe, and is always relieved by the forced extension of the limb. Sometimes there is slight jerking of the right leg without pain. Neither leg can be raised from the bed; both can be moved a little, with difficulty. The motion of the toes seems almost as free as it should be, but perhaps a little restrained by their hide-bound condition. Sensation is nearly normal all over both limbs, though perception is not very rapid or acute.

The electric conditions were so curiously confusing that at the risk of being prolix I give the result of the examination in full, only prefacing that the study was very carefully made.

Faradic Current.—In the right leg the muscles supplied by the peroneal nerve respond well to a current through the nerve, but to direct stimulation there is no action until the poles have been on the muscle fifteen or twenty seconds. The contraction is obscured by the reflex excitation in other muscles. In the right thigh a slight contraction was effected after the current had passed for one-half minute through the crural nerve.

In the left leg the muscles responded to applications to the peroneal nerve after one-half minute. In the left thigh the result of a current through the crural nerve was better, but not equal to normal.

Galvanic Current.—The whole strength of a twenty-cell battery produced no effect on the muscles of the right thigh and gave extreme pain. In the right leg, after an interval, the muscles supplied by the peroneal nerve responded well.

In the left thigh no contraction could be secured either by direct or indirect applications. In the left leg, after a short interval, the anterior tibial could be stimulated to respond through the nerve, but no effect was gotten by direct currents.

The patellar reflex is slight, but is undoubtedly present in both legs.

Some explanation of the slowness of the reactions is afforded by the following table showing the cutaneous resistance to galvanism:—

Measurement of Cutaneous Resistance (C. R.) to Galvanism.

	30 seconds.	1 min.	2 min.	3½ min.
On backs of forearms an application of 20 cells gave a deflection of . . .	10°			
" inner surface of forearms . . .	12			
" the bend of the elbows	7			
" inner surface of upper arms . . .	11			
" outer surface of thighs	13			
" middle of anterior surface of thigh .	13			
" popliteal spaces	5			
" outer surfaces of lower legs . . .	1			
" inner surfaces of lower legs . . .	½			
" calves	0		1°	2°
" on dorsal surfaces of feet . . .	0	½°		
Six inches apart laterally in lumbar region	9	10½	11½	

The degrees are degrees of deflection of a galvanometer.

The treatment which followed this lady's admission to the Hospital consisted of mechanical tonics to the indolent skin and circulation and muscles of the legs, and of a diet restricted at first to small quantities of milk to reduce her enormous bulk. She was put on four ounces of skimmed milk every two hours, which was found to be enough for her needs. It was well borne, and caused no inconvenience. Very thorough daily massage of the legs, and daily applications of the faradic current to the muscles of the paralyzed limbs, and of the galvanic current to the spine, were added to this.

Careful measurements of the legs were made before and after massage every day. It is remarkable that for several weeks there was noted with great regularity a diminution in the circumference of the legs of from one-fourth to three-fourths of an inch after rubbing. This refers only to the calves, as but very little change could be made in the thighs in this way. The size of the legs gradually lessened from 15½ inches on Nov. 20 to 14⅛ inches, Nov. 29, to 13 inches, Dec. 10. During the same time her weight had fallen from 226 to 215 pounds. A rubber bandage was carefully and closely applied on the left side from below the knee to the waist, Dec. 1, and the right leg was put on a Stromeyer splint and the angle rapidly increased with the screw. The skin grew softer and the power of movement of the legs increased a good deal under this plan. At the end of a month a little more liberal diet was ordered.

In the middle of January, when her strength was so much improved that she was able to sit up alone in bed, or move herself to the edge of it, through the neglect of a nurse to change the splint and dressing, a small sore formed on the right heel and an attack of erysipelas followed. Quinine, wine, and iron were given; the massage and bandaging of the left leg continued, but the Stromeyer had to be removed. A daily stretching of the leg by the nurse kept up the mobility that had been gained, and when the inflammation subsided an extension apparatus and a sandbag kept the limb in good position.

The patient was discharged from the hospital in the latter part of March. There was then a clear gain of power and bettering of the nutrition and circulation in the extremities and a very considerable improvement in her general health and condition, while her weight had fallen to the more comfortable size of 190 pounds. An electric examination made a fortnight before her discharge compares curiously with the one made on her admission.

Faradic current, normal.

Galvanic current, normal, but restrained by reflex excitation.

By the galvanometer the cutaneous resistance to 20 cells, galvanic current was measured by the deflection of the galvanometer as follows:—

	30 secs.	1 min.
Each pole placed in front of thighs . .	15°	—
" " " " " legs . .	9	—
" " " calves . . .	11	12°
" " " dorsum of feet . .	7	7+

Soon after my first notes of this case were made I removed with a canula and harpoon what I supposed to be two portions of the soleus muscle, inserting the instrument about two inches. On examination they proved to consist only of subcutaneous connective tissue. I could find nothing pathological in their structure when examined with the microscope, but Dr. Formad gave a different opinion, which I shall presently state. On a second attempt I secured a small fragment of muscle, this time taking it from the lower part of the calf of the right leg, and, as I think, from the gastrocnemius. I studied it carefully and was convinced that the muscular fibrillæ were both longer and broader than natural fibres, but I could find no other alteration than that of size. There was no substitution of fatty or connective for muscular tissue, no atrophy or degeneration—nothing but a decided hypertrophy. All these specimens were submitted to Dr. Formad, who kindly sent the following opinion, saying, however, that he would like a further study of the muscular tissues. The securing of another fragment was rendered too dangerous by the erysipelas mentioned in the history:—

"The examination of the subcutaneous connective tissue revealed quite satisfactory results. It appears to give evidence of the existence or the development of elephantiasis, and the muscular tissue reveals true hypertrophy, some of the fibres yielding on measurement twice the thickness of normal fibres, compared side by side and similarly treated."

A number of micrometric measurements were made, both of the cells and fibres of normal tissues and of the fragments from the calf of Mrs. S., so that there is no doubt of the accuracy of the result.

To sum up, this case presents a total of several unusual conditions: the paralysis, without any degeneration reaction, the enormous hypertrophy of the skin and subcutaneous tissues, and the increase of the size of the muscles due to the extraordinary overgrowth of their fibrillar elements. It has certain features in which it resembles scleroderma, and some that are like elephantiasis, and without the microscopic investigation it might have been taken for what on the first superficial examination of the patient we thought it—pseudo-hypertrophic paralysis.

But the skin here had not the tense, hard induration which scleroderma shows. Scleroderma is usually found with more or less pigmentation; it begins with pain and œdema, and is nearly always accompanied by atrophy of the underlying muscles, and though it varies in position and may be limited or diffuse, it is, I believe, seldom or never so absolutely symmetrical as the lesion I have just described. Certainly there is a slight likeness to elephantiasis in the skin condition, but the general fever and inflammatory symptoms of that disease were never present, nor has the course been like that of elephantiasis, which progresses by recurrent attacks.

Nor on careful comparison does it seem much like the pseudo-hypertrophic paralysis. The age of the patient—this paralysis is almost unknown in adults except where it has continued from infancy—the persistence of the knee-jerk, and the troubles being, even after lasting so long, entirely confined to the lower extremities, are some of the differences. Here, too, we can discover no loss of voluntary contractility in any other than the affected muscles, nor any atrophy of the pectoral or dorsal muscles, a condition which Gowers calls diagnostic of pseudo-hypertrophy. To the eye and touch, besides, the muscles in this case were much more lumpy and less homogeneous than they are in the false overgrowth.

A few cases—six or seven, I think, only—of true muscular hypertrophy have been reported, all of them, so far as I know, by German writers. The overgrowth in all of them was limited to the muscular tissue, and the malady began after great and long-continued exertion, or after depressing disease or injury. All of them were unilateral and in one limb only. Studies of extracted fragments of muscles showed the fibres to be double the natural breadth, and demonstrated an increase in the number of nuclei.

So far as I have been able to discover during the year which has passed since I first examined the case, there has been nothing like it known, and I think I have shown good grounds for saying that the complexus of symptoms is entirely a new one.

I am indebted to Dr. Massey, Electrician to the Infirmary for Nervous Diseases, for the use of his notes of the electrical examinations.

ARTICLE XI.

A CASE OF VITILIGO INVOLVING THE WHOLE SURFACE.[1]

By HENRY W. STELWAGON, M.D., Physician to the Philadelphia Dispensary for Skin Diseases, Chief of the Skin Dispensary of the Hospital of the University of Pennsylvania, etc.

THE patient, a male, aged 37, whose disease will be briefly sketched in this paper, came under my care in June of 1880. He is of Austrian birth, coming to this country when sixteen years old. Is of robust health, dark complexion, and always had a naturally dark skin. In 1870 or 1871 he was taken down with an attack of smallpox, from which he made a good recovery, with but a moderate degree of scarring. From the time of his arrival in this country up to ten months ago, he followed the occupation of a longshoreman.

Six months after the attack of smallpox he noticed a few small pea-sized pale spots on the face, to which, however, he gave but little thought, and no attention. Several months later on, spots of the same character appeared on the backs of the hands, while those on the face had become more noticeable from the fact that the surrounding adjacent skin had grown considerably darker than that on other parts of the body. As summer advanced, although there was only a slight increase in the size of the spots, yet they had become even more conspicuous from the general sun-bronzing resulting from the constant exposure which his occupation necessitated; the paleness of the spots remained unaffected. During the latter part of the summer the patches continued to grow slowly; never at a stand, although at this time, and for several years subsequently, the increase from month to month was barely perceptible.

So the disease progressed until about six months before his coming under my observation, when it began to extend much more rapidly, showing itself upon the arms, legs, and trunk, while the individual patches themselves grew much larger. There were, as usual, no subjective symptoms. Dyspepsia was the sole trouble he had during this time; this was tolerably severe, and persisted throughout. In fact it had been present before the patches appeared, and still persisted. At the time of his coming under my care the disease had involved a greater portion of the whole surface. The eyes were ringed with a border at least two-thirds of an inch deep; other parts of the face were also affected. The backs of the hands were almost completely occupied with the characteristic pale patches. The forearms, the arms, legs, and thighs, as well as the feet and trunk, were likewise involved. Immediately surrounding the patches the skin was considerably pigmented, to such a degree, indeed, as may be looked upon as extraordinary even for a case of vitiligo. The pigmentation extended several inches beyond the edges of the leucodermic patches, becoming less intense as the distance from the patches increased, and gradually fading away into the normal skin. Between the pigmented borders of the patches the skin was of the natural color. The patches, as the patient stated, were extending rapidly, and many were becoming confluent and covering large areas of surface; in fact, the disease, the past six months, according to the statement made, had involved several times as much surface as the seven or eight years preceding. The hairs on the parts affected were to a great extent white or grayish. Several tufts of white hair could be seen in the scalp. The man was indifferent as regards the condition of the skin, and had been referred to me by the resident physician of the dispensary, to whom he had come for relief of his dyspepsia.

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[1] Read at the Eighth Annual Meeting of the American Dermatological Association, Highland Falls, New York, August 29, 1884.

I saw the patient ten days later, in the mean time a pepsin mixture having been prescribed; the patches, even after so short an interval, seemed a trifle larger, and the excessive surrounding pigmentation remained remarkably conspicuous. The patient was not seen again until one year ago, and then only accidentally. The whole surface was an unnatural white. To one unacquainted with the patient his appearance would probably have excited no further comment than that he was just recovering from a severe illness which had produced profound anæmia. It resembled the paleness seen in the last stages of phthisis and albuminuria. To a close observer, however, the whiteness could be seen to be of a different character from that in the diseases referred to. It was more of a dead, marble-like whiteness. There were two small patches of pigmentation on the cheeks, which were evidently traces of the confluent pigmented borders of the vitiligo spots. The man considered these the last vestiges of the disease. As large areas of the skin became white from the running together of the vitiligo patches, the islets of pigmentation—fragmentary portions of the confluent pigmented borders—were viewed as the disease, and the whiteness as returning natural skin. The patient was aware, however, that his skin was now much paler than before the disease began, and what is still more to the point, in answer to questions, stated that the skin, so far as the paleness was concerned, was uninfluenced by exposure to the sun, the same as he had noticed in regard to the individual patches before. This was the case. The patient followed the same occupation, and, although it was summer, and he had had the usual amount of exposure, the paleness of the skin was unaffected and presented the unnatural appearance described above.

Several months ago I sent for the patient, and a glance showed the same condition as had been noted when last under observation, except that the few islets of pigmentation referred to had disappeared and given place to the unnatural paleness of vitiligo. The color of the hair had undergone no appreciable change. A thorough examination of the whole surface showed that on parts of the trunk the skin exhibited a tendency to a return of the natural color. The patient's general condition was about the same, dyspepsia being his sole complaint.

ARTICLE XII.

THE TREATMENT OF HEMORRHOIDS BY INJECTION.

By CHAS. B. KELSEY, M.D., of New York.

ABOUT five years ago in the first edition of my work on *Diseases of the Rectum* I committed myself to a favorable opinion of the treatment of hemorrhoids by injection in the following words:—

> "The treatment of hemorrhoids by injection of certain substances, chief of which is carbolic acid, may now, I believe, be accepted as a surgical procedure of a certain definite value, and one worthy of a place among the recognized means of cure at our command. Originating as it did among the quacks, it has been looked upon with suspicion, and its adoption by the profession has been followed by the accidents which generally attend a new remedy before its applicability is fully understood; but this does not diminish its real value."

This was written in the face of the fact that none of our standard text-books on the rectum spoke favorably of this treatment, and those who did not pass it over in silence only referred to it in condemnation. Allingham was then as now upholding the ligature, and Smith the clamp and cautery. The former in his edition of 1879, p. 117, says:—

> "Many American surgeons who come to see the practice of St. Mark's have repudiated the treatment in round terms, and call it uncertain and dangerous."

He does not "feel quite satisfied" that Cook has made out a good case for the carbolic acid treatment; but seems satisfied that Matthews, of Louisville, has made out a good case against it as being painful, insufficient, and liable to cause death from peritonitis, embolism, and pyæmia. He says:—

> "I tried the injection plan on some few cases, but the result was much pain, more inflammation than was desirable, a lengthy treatment, and the result doubtful, certainly not a radical cure."

Dr. Matthews's paper to which he refers was read before the Kentucky State Medical Society in 1878, and a copy of it was in my possession. He seemed a little uncertain in his dictum, was generally, as Allingham says, against the acid and in favor of the ligature, but still used the acid in certain selected cases, and seemed to like it. I did not know that Cook had tried to make out a case for the acid; the only reprint of his which I had on the subject being decidedly against it. He probably wrote differently on the subject at another time.

At that time these opinions had the greatest weight with me. In fact the only way of curing hemorrhoids which I could really recommend was Allingham's way, and I invariably practised it. Since then I have come to prefer Smith's operation where any so-called operation is indicated; but in the mean time a certain unanswerable argument was submitted to me every few days which I was obliged finally to acknowledge. This argument came chiefly from the practice of a near neighbor in New York, who, though an irregular practitioner, certainly had a way of curing piles which might cause more inflammation than was desirable, and might be lengthy, but certainly caused no *pain*, no *peritonitis*, *embolism*, or *pyœmia;* and although the result might be "doubtful and certainly not a radical cure," yet it satisfied the patient thoroughly.

Again and again in this stage of my practice I have advised the operation by ligature and have had my patients tell me a few months later that they were cured, positively, satisfactorily, and painlessly, without operation, and without confinement to the house. Moreover, they were cured by injection. It is useless to uphold recognized and time-honored practice in the face of such evidence as was constantly thrust upon me without careful investigation.

These were not ignorant dispensary patients, but gentlemen and ladies of intelligence; and after fighting the logic of facts as long as I could, it finally impressed itself upon me that an intelligent man who had suffered from piles ought to know whether he was relieved or not; and I began the treatment by injections timidly and cautiously at first, collecting all the information possible and making many experiments. When a patient would consent I still operated by the ligature, reserving the other plan for those who positively refused operation, and giving rather doubtful opinions as to its permanent results.

Since then my ideas have changed. Out of all the cases of hemorrhoids which have come to me during the past two years I have only "operated" twice, and yet I have no reason to believe that I have failed to effect a satisfactory cure in any case. These cases are both peculiar and may perhaps be of interest.

Case I.—A gentleman from a neighboring State came to me one day with the statement that he was "afraid he had been a fool." Several of his friends (good people of good judgment and sense) had been cured by a quack in N. Y., of the piles. No operation had been done; they had suffered no pain; had not been confined at all; and were perfectly well according to their own ideas. One of them was a bank president, the other a prominent man of business, and on their recommendation he had visited the quack and had submitted to an injection of carbolic acid, which had not caused him anything but the most trivial annoyance.

He had returned to his home and meeting his family physician the next day had related his very satisfactory experience. The physician told him he had made a mistake and was taking a great risk; that the man he had seen was a quack; that carbolic acid injections were all nonsense ; and advised him to hurry down to me. He came the next day demanding an operation. The injection was working well, would certainly have cured the large hemorrhoid into which it was placed ; and if the patient had asked my advice I should have been obliged to have told him to go on with his quack or let me take the place of the quack and go on with the same treatment. However, he had "come for an operation," he "did not want any more nonsense of that sort," and he wanted me to "cut them off." I did it with the clamp and cautery, and the man went home cured and satisfied.

The second case was a peculiar one.

CASE II.—The patient had been a sufferer from piles for many years, and the tumors were large, prolapsed easily, and caused him much annoyance. About a year ago one of them at the verge of the anus became inflamed, suppurated, opened, and discharged. It opened both on the cutaneous and mucous surfaces by a large patulous opening, and left a subcutaneous fistula through which the little finger could be passed. The fistula was broad and shallow; the tissue which made it a fistula very slight; and in the cutaneous orifice of this canal appeared a mass which puzzled his attending physician and likewise puzzled me when I first saw the case.

I was summoned by telegram to come to the middle of the State, and I found the following condition : The external orifice of the fistula was first seen near the verge of the anus ; large, patulous, ragged, admitting easily the tip of the little finger. Filling this orifice from within was a round cauliflower growth ; evidently too big to get through the orifice and yet filling it from within like a ball valve. It was this thing which had led to my being called, the attendant having in his mind cancer, gumma, and all sorts of complications.

The patient was etherized, and the growth, which puzzled us both, found to be an internal hemorrhoid trying to protrude through a subcutaneous fistula. The condition was simply this: a large cutaneous tag had suppurated and opened on the cutaneous and mucous surfaces by large patulous openings. An internal hemorrhoidal tumor had entered the mucous opening from above and was trying to escape from the cutaneous opening below. I divided the bridge of tissue which formed the fistula and removed the hemorrhoids by the clamp and cautery operation. The patient went around a little too soon, and when he reported to me in the city in the fall, had an unhealed wound which it took several weeks to cure.

These are the only two cases in which I have put a patient under ether to cure his piles in two years and more. In that time I find by an examination of my case-books that I have cured over two hundred cases of hemorrhoids by the injection of carbolic acid.

It is impossible for me in an article of this nature to give the particulars of each of these cases, nor is it necessary. I shall simply report a few of the most typical of them in detail, and then give the general conclusions to which I have arrived from my experience with this method of practice.

CASE III.—Man, aged 50. Had suffered from hemorrhoids for several years, and was in very bad general condition in consequence. There was pulmonary trouble and loss of sexual power, much emaciation, and the usual signs of the loss of blood. The tumors prolapsed easily and were very large. The sphincter was relaxed, and the slightest straining was sufficient to bring down the whole circle of mucous membrane. There were five distinct tumors, three of them larger than are often seen; and joined with them a decided prolapse of the anal mucous membrane.

Injections were first made into the more prominent individual tumors, and then into the hypertrophied mucous membrane over the external sphincter. The treatment lasted ten weeks in all before he was finally discharged cured, and ended about three years ago. He called on me a few weeks since and reported himself still perfectly well. There had been no bleeding, and no tendency to protrusion. The only sign of his former trouble was the presence of a couple of cutaneous tags which had never caused any uneasiness, and which I had not thought it best to remove while he was under treatment.

The first few injections in his case caused him some pain, and he used an opium suppository two or three times. One injection caused a decided slough of a tumor well up the bowel; and one, placed in the centre of a large muco-cutaneous tag, caused suppuration which discharged on both its surfaces, the mucous and cutaneous, leaving a small bridge of tissue between, which I snipped with scissors.

I give these particulars because the case was a bad one as such cases go, and caused an unusual amount of trouble.

But, during it all, the patient was at no time confined to the house, or unable to attend to his business; in fact most of the time he was free from all suffering, was perfectly satisfied with what was being accomplished from week to week; and at no time would he have entertained the idea of an operation.

The following case illustrates what may be done under even more trying circumstances.

Case IV.—Man, aged 25, waxy from loss of blood, very weak, and with organic heart trouble. His life had been a very hard one, and though anxious to have something done for many years, his circumstances had only just become such as to permit of it. He had had a prolapse since his early childhood, and could never remember the time when there was not a protruding mass from the anus and a discharge of blood at stool.

On examination I found the anus surrounded by a cauliflower growth which at first sight it was difficult to diagnosticate. It was covered by pale, flabby, unhealthy granulations which bleed a little when scraped, and seemed inclined to bleed more except for the lack of blood in the man's veins. It was not very sensitive to the touch, never returned within the bowel, and gave rise to a slight mucous discharge. Defecation was not particularly painful, and the sphincter was relaxed. The mass was not evenly developed all around the anus, but was larger on both sides than in front or behind. At first sight I was inclined to consider it cancerous, but it was simply an old prolapse which had undergone the usual changes which a prolapse of twenty years' duration outside of the body will undergo.

I selected the most prominent part of the tumor, one of the lateral halves, and injected into it a fifty per cent. solution of carbolic acid. The application itself caused only trifling pain, but the next day the patient preferred to spend on his back, and a week later a large slough had separated leaving a healthy surface, and the tumor was reduced about one-third. This treatment was repeated three times at intervals of a week, and at the end the external mass had almost disappeared. The injections were then carried further up within the anus, each one causing the disappearance of a part of the mass, and in about eight visits the man was cured, having been confined to his room only a single day after the first application. There can seem to be no question as to the permanency of this cure, for the tumor is as completely gone as it would be after an operation with the clamp and cautery.

These two cases make about the worst showing for this method of treatment of any in my case-book, and are given for that reason. In both the time required for a cure and the suffering caused by the injections were at the maximum, and yet both were perfectly satisfactory to the patients while the treatment was going on, and the results were equally satisfactory to me in the way of radical cure.

The element of time by this method is seldom of much importance though it occasionally comes in as in the following case.

CASE V.—A man, aged 40, from the Black Hills, stopped over in N. Y. on his way to Florida and was referred to me by Dr. R. W. Taylor. His piles were of moderate size, but prolapsed easily and bled freely. He had once, four years previously, been on the operating table with the ether over his face, but changed his mind at the last moment; the sight of the instruments to be used being too much for his courage.

He was in great haste to leave the city, and being in good condition and full of nerve, I determined at his earnest request to push things. I made four injections into four separate hemorrhoids within three successive days. He waited three days longer to see that no bad results followed, and left the city on the seventh day. On the fourth day there was pain, but the man was much disappointed that I refused to make another injection, and at no time thought of resting from his business in the city. After the fourth day there was no protrusion and no bleeding; by the seventh day he pronounced himself cured and promised to notify me if there should be any return of trouble.

That was eight months ago, and I have not heard from him, and do not expect to. Still, I do not advise any such haste in treatment, and relate the case merely as an example of what can be done. The following cases are fairly average ones both as regards the time and the suffering.

CASE VI.—Physician, aged 50. Hemorrhoids for several years. The protrusion and suffering were such as to seriously interfere with professional work. The first injection was made May 20, the last July 11, at intervals of one week. There was marked improvement after the first one which steadily increased till the last. Never during the treatment did he suffer as much pain as he often suffered from protrusion before the treatment began.

CASE VII.—Sent by Dr. Bullard. Man, aged 42. Severe and long-standing hemorrhoids. Bleeding very profuse, and the protrusion such as to interfere seriously with his work. The treatment was begun Mar. 18, 1883, and ended May 6, the injections being made once a week. There was immediate relief after the first one, and steady improvement to the end.

At no time was there any suffering, and the duration of treatment could easily have been shortened one-half had it been desirable. This case has remained perfectly well to the time of writing.

CASE VIII.—Sent by Dr. Campbell. Lady, aged 42. Nervous and timid. Hemorrhoids moderate in degree but causing much suffering. Treatment begun Feb. 17, ended April 7. Injections were made once a week, sometimes twice, and never caused more than trifling pain.

CASE IX.—Sent by Dr. Zolnowski. Man, aged 55. Had suffered for many years. After a single injection into the most prominent tumor this patient was so sure he was completely cured that he remained away for some time. He had absolutely no pain, and after a couple of weeks took a five mile walk—a thing he had been unable to do for years—to tell me the result. Two other injections were made at my request into other tumors, and the patient discharged perfectly satisfied.

CASE X.—Sent by Dr. Spitzka. Man, aged 47. Suffering from locomotor ataxia and hemorrhoids. Eight injections were made at weekly intervals. This patient only came to the city once a week to transact business. He always came first to my office, and never found that the injection he received caused him any uneasiness during the day.

Let me now state a few general facts. After an experience which I consider amply large for a fair test of this plan, it has become my routine practice. I no longer advise a patient first to be operated upon, and adopt injections when he or she has refused, as was my former practice; but I advise this from the first and promise a painless, radical cure in a few weeks without confinement to the house. This point of confidence was not reached without many misgivings. I had the benefit of nobody's former experience, and had to reach my own conclusions by trials on carefully selected cases. In all my cases I never have known a patient abandon the treatment after it was begun but once or twice. In one of my early cases (I think the third in which I practised it) the gentleman suffered more from the first injection than he ever had from his piles, which were really very insignificant; and having an intercurrent attack of malaria, abandoned the idea of being cured.

In another (an hysterical servant girl) there was terrible imaginary agony before I was able to make an injection at all, but after it was made she announced that the pain was really trifling. In one other case a man began the treatment and disappeared after the first injection, but probably because of a sudden call to the West which he warned me might come at any time. One case, therefore, refused to continue the treatment on account of pain, and two disappeared after the first injection for some unknown reason. These are the only ones in my experience who after the first injection were not anxious to continue till cured, and were not under observation to the end.

In all of my cases I have never failed to effect a perfectly satisfactory cure—one which I consider as radical as by any other method of treatment. Many of them have been under observation four years since the cessation of the treatment with no return of symptoms. If in any case there has been a return I have failed to hear of it, and as I have been particularly anxious on this point, and have offered every inducement for the patient to return, I should probably have heard from some of them.

In no case have I had an accident of serious nature. Never any signs of embolus; never any serious sloughing or inflammation; no trace of pyæmia or hemorrhage. The injections which I use varying from the pure carbolic acid, to a ten per cent. solution of the same, often cause a slough; but the amount of sloughing has always been in direct proportion to the strength and quantity of the injection; can be regulated at will; and has never been of sufficient extent to cause me the slightest mental uneasiness. In some cases I deliberately cause a slough each time I make an injection; in others I carefully avoid a slough. Either can be done at will.

There has never been any constitutional disturbance, any retention of urine, any febrile reaction, or any of the usual symptoms following either the operation with the ligature or the clamp; and I have never been troubled by a wound after the separation of the slough which has required any additional treatment to induce it to heal.

At the present time I have under treatment a young man from whom an hemorrhoid was removed over two months ago by the ligature. He went to his business on the third day after operation and seven weeks after came to me with a large unhealed wound discharging and bleeding freely. The hemorrhoid was apparently at the verge of the anus; at all events there is a tag of skin with an ulcerated internal surface which extends well up within the sphincter. Such a case is much harder to cure than any case of hemorrhoids. It may be said that the man was allowed to go about too soon after the operation. Probably he was. I have reported one case in this article where the same accident happened after an operation of my own though the patient was kept quietly in his room for ten days by his attendant. I have never seen any such result follow the injection of carbolic acid.

As regards the amount of pain caused by the injections, I have had several physicians whom I have cured by this plan (judging from my own practice it is a favorite plan with the profession) assure me that they suffered no more pain than an ordinary hypodermic puncture into this very sensitive part would cause. For a couple of minutes there was a smarting, tense feeling, and after that no sensation whatever. This has been repeated six or eight times till the patient was cured; but there was no secondary suffering, and the intervals between each injection were passed in absolute comfort. This evidence is particularly valuable as coming from such a source. On the other hand, I have had a patient faint on the table from the first injection. This is rather startling and not at all pleasant for the operator. However, I have never seen it but twice, and I remember that I have seen exactly the same thing twice from vaccination. In fact pain is difficult to estimate, and the pain which will be caused by this treatment is now the only doubtful point connected with it in my own mind.

I generally make ample allowances, err on the safe side in my prognosis, and begin gently till I get the confidence of the patient. It varies much. One patient will say it is absolutely painless, will press the part for a moment, declare it is all gone, get up and do an active day's work. Another will complain of more or less soreness for five or six hours. Only in rare cases will one go home and spend part of the day in bed, and worse than the latter I have never seen. I formerly gave each patient some opium suppositories to use in case of necessity. Never but once or twice have they availed themselves of them.

Compare this experience with the universal experience with Allingham's operation. I have never seen worse pain, lasting sometimes a week, than that operation can cause. I have in my own practice kept a patient fully under the influence of morphine for a week; seeing her day and night at frequent intervals; to try and get relief from the constant spasm of the sphincter and levator caused by the presence of the ligatures. Again and again I have been reproached by my patients who have made a good recovery, but who have assured me that they would never go through the same thing again. More than one woman has told me that the pains of childbirth did not compare with what they suffered after the operation for piles. This I believe to be not an uncommon experience, for I have seen it in strong men and delicate women, patients of my own and those of others. I have done the operation many times, and have abandoned it for this and other objections to it, which I do not care now to discuss. I have found Smith's operation much more satisfactory, as he told me I would if I would only try it.

Dr. Matthews, in his "Objections to the Use of Carbolic Acid," already referred to, says:—

> "Admitting that a slough is produced and the wound left to heal by granulation, I fail to see any advantage over the ligature. You have as large a base to heal, consequently a longer time to effect a cure."

There seems to be truth in this, and yet it is easily answered. 1st. In only a few cases is slough produced. 2d. A granulating surface left after a slough caused by carbolic acid which refuses to heal spontaneously must be very rare. I have never seen one out of many such cases. Probably I have caused sloughs and granulating surfaces resulting one hundred times in two hundred cases in five years. I never have had to treat one locally to induce it to heal. During the same time I have had to treat several caused by the ligature, and very bad cases to treat they were. But, supposing, with Matthews, that the sloughs are the same, and the time and trouble it takes to cure them the same; the difference in the way they are caused is very great, and herein is the advantage of the one treatment over the other. The result being the same, my patients much prefer to have their slough caused by an injection of carbolic acid than by the operation with the ligature. If a man is to suffer execution, he might prefer being shot to being flayed alive.

There is but one more point. In my experiments on this subject I have tried iron, ergot, and ergotine, and have abandoned them all. In cases even of severe prolapse I prefer to inject carbolic into the tumor rather than ergotine around the tumor. It causes less pain, and is more reliable. The strength of the solution of carbolic acid varies greatly. I have three solutions constantly ready, one of fifteen per cent. one of thirty-three, one of fifty, and sometimes use the pure acid. In a severe case I begin with the stronger ones, in a mild case with the weaker. A bad case of well-defined, prolapsing internal hemorrhoids is much better to treat than a mild case of small tumors near the sphincter. It is unnecessary to repeat what I have already written as to the practical details of the treatment.[1] One object in writing this is to answer numerous letters from practitioners to know whether I am still satisfied with it and continue to recommend it.

25 MADISON AVE.

ARTICLE XIII.

A CASE OF CÆSAREAN SECTION. By E. MILLER, M.D., of Florence, South Carolina.

PELVIC deformities in women being very rarely met with in my own State, as well as the other obstacles to delivery which call for the performance of gastro-hysterotomy, this operation has been one of very great rarity when compared with the statistical records of several of our States. Of 136 cases collected by Dr. Robert P. Harris, of Philadelphia, nearly one-half of which have never been published by the operators, but two belong to the credit of this State, the first being that of Dr. J. Walter Hill, of Edgefield, who operated on October 9, 1869, upon a colored woman of 32, in her second labor, the cause of difficulty arising from vaginal obstruction following her first delivery twelve years before. This labor was one of six days, and was followed by inflammation, sloughing, contraction of the vagina, and a vesico-vaginal fistula. The pelvis was believed to be normal. Although the second labor lasted fifty-six hours, the woman and her son, "Julius Cæsar Gray," were saved, the abdominal wound healed in eleven days, and the boy was still living sixteen months later.

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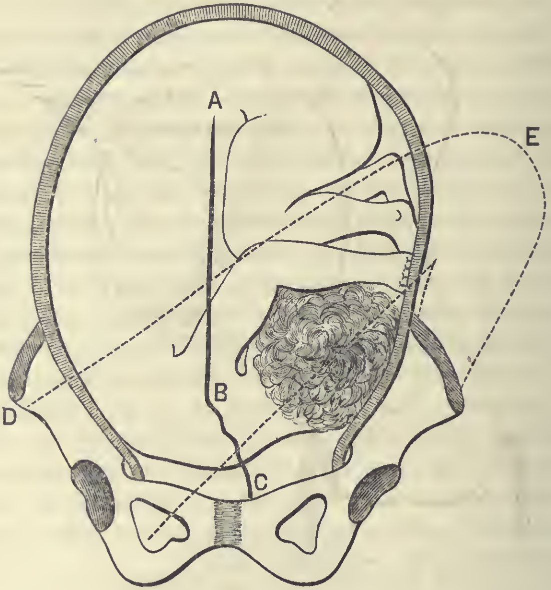
[1] Diseases of the Rectum and Anus, 2d edition. N. Y.: Wm. Wood & Co., 1884, p. 143.

Although my own case had a much less fortunate termination, owing largely to the low grade of health in the woman, complicated by eclampsia and a rupture of the uterus, I believe it to be my duty to report it, as I think all such should be, for the benefit of obstetrical science. If all cases, whether successful or fatal, had been published, the work of collecting them would not have occupied the attention of Dr. Harris for sixteen years, and the medical world would have been much more generally acquainted with the causes of fatality and the requisites for success. Unfortunately for the cases operated upon, the accoucheur is seldom the operator, and the services of the latter are too often called for when it is too late to make his work a success. The high rate of fœtal death in American cases is indicative of this, and the low rate of fatality, both in mothers and children, when the operation is *timely*, shows clearly that a very early resort to the knife is a lesson that should be learned by every one engaged in the practice of obstetrics, particularly among the poor of cities. But one other case of *gastro-hysterotomy* is recorded by Dr. Harris, in which a rupture of the uterus was found to have taken place when the abdomen was opened, and was enlarged by incision for the delivery of the fœtus. This case occurred in Ohio, in 1833, and resulted in the recovery of the woman, but the child was lost, the rupture was a very slight one. This form of case must not be confounded with that of uterine laceration where the rent is sufficient for the exit of the fœtus, and in which delivery is effected by *laparotomy* without uterine incision; such cases have no title to the name *Cæsarean.*

CASE.—The subject of my operation was a deformed and dwarfed mulatto primipara in her twentieth year, who had been confined to bed for fourteen years, during which period she had not been able to walk ; she would probably have measured about four feet, or four feet two inches. She had been the subject of double coxalgia, and both joints were anchylosed, giving rise to a pelvic deformity, by which the superior strait was contracted in its conjugate to perhaps two and a half inches. Both of the lower extremities were flexed upon the body, and the right one so much so, that it rested obliquely upon the abdomen and indented it by pressure. They were much emaciated, were œdematous, and broken out with small sores and a scaly eruption ; there was also a deep, ragged ulcer midway between the vulva and anus, which presented the characteristic marks of syphilis. The woman lived in poverty, and weighed but sixty pounds, she also presented in her legs some evidences of having been rickety in early childhood.

When taken in labor under the care of Dr. Jarrot, of Florence, she in time was seized with convulsions, for which he gave her two grains of sulphate of morphia, which, not relieving her, he called upon me, and at my suggestion administered two more grains, hypodermically, after which the convulsive movements ceased. I saw her for the first time on the morning of February 20, 1885, and found her breathing heavily. Her abdomen was tympanitic above the uterus, and there were no uterine contractions, these having ceased suddenly, giving rise to the belief that she may have ruptured her uterus. The os uteri was found of the size of a twenty-five-cent piece, and the tissues relaxed, there was but little hemorrhage. We decided, under all the difficulties of the case, to deliver by the Cæsarean section. (Fig. 1.)

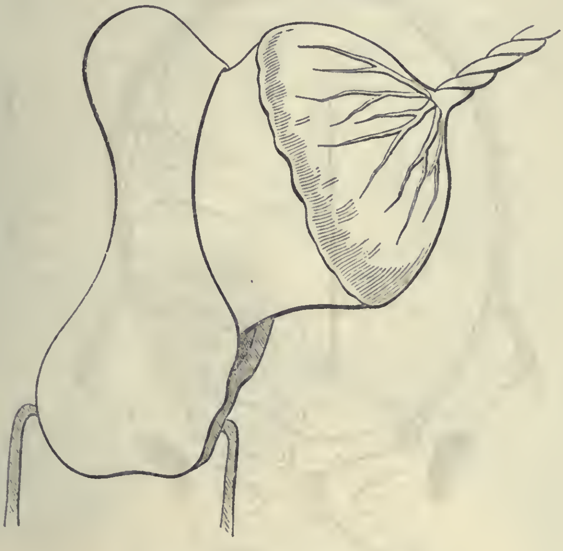
Fig. 1.



A, *B*. Line of incision in uterus.
B, *C*. Rent of uterus connecting with incision.
D, *E*. Position of right lower extremity.

At the time of the operation the woman had been more or less in labor for thirty hours, and twenty-two hours had passed since she had taken any morphia. She had a feeble pulse of 118, a respiration of 20, and her extremities were cold; being unconscious, no anæsthetic was used. An incision six inches long was made in the median line, and nearer to the umbilicus than the symphysis pubis, the flexure and anchylosis of the lower extremities making this necessary. The distended intestines were with much difficulty kept back, and were punctured in several places with a hypodermic needle to evacuate the gas. The incision of the uterus led into a rupture of the lower part of the body and cervix, opening the organ to the extent of about eleven inches, six inches of which were by incision. Although laceration was believed to have taken place, it had not been positively located until cut into by the knife. After the uterus was opened, the fœtus was seized by the left arm and delivered, and the cord cut and tied. The uterus, in its contractions, now presented, under the eye, the curious phenomenon of inversion, the right antero-lateral portion, to which the placenta was attached, being driven through the uterine wound with the disk firmly adherent. (Fig. 2.) Although an effort was made to detach the placenta, it seemed only to become more firmly fixed as the convexity outward increased, and the parts became consolidated by contraction. Finding the placenta immovable, I, with my two thumbs placed on either side of the cord at its origin, and my fingers spread out over the back of the uterus to antagonize them, readily indented the protruding portion, which, being started, became restored by a spontaneous movement. The uterus now contracted normally, and the placenta was gradually separated, the mouths of the bloodvessels being closed so perfectly that it was difficult to distinguish its former site.

Fig. 2.



Uterus inverted through the incision.

The uterine wound was closed by thirteen silk sutures, but a portion of the rent in the neck was not sewed up, it being inaccessible because of its position under the right thigh; after the organ had fully contracted, the laceration was not distinguishable.

The patient lost but little blood from the operation, but when the abdomen was opened it was found to contain a considerable quantity mixed with amniotic fluid. The fœtus was not weighed, but was above the average size. After the uterine wound was closed I cleansed the abdominal cavity thoroughly, and closed the wound with ten sutures. When half had been passed, the patient exhibited very unfavorable symptoms, and ether was administered hypodermically; an order was given to place bottles of hot water around her, but, regardless of instructions given prior to the operation, they had not been provided. As the last abdominal sutures were being passed she died. There were no symptoms indicative of opium poisoning, but the shock and depression resulting from the rupture of the uterus (which was the main reason for the operation) were so great, that we believed from the first that the chances for recovery were as ten to one against her.

I am indebted to Dr. Harris for the following interesting facts and observations: "Of the 136 Cæsarean cases in my note-book, but one other died during the operation, which was performed in New York City in 1860, upon a patient nearing the maturity of gestation, but not in labor, who had been for six hours in convulsions. In no other American case is there a record of uterine inversion. This may be partly accounted for in your own by the extreme length of the uterine opening. As the organ had been a long time in a quiescent state and partly emptied, any slight traction upon the cord in removing the fœtus might indent the flaccid uterine wall and favor inversion, if muscular contraction was at that moment revived. I do not remember to have seen any similar accident recorded of any foreign case. Your operation increases the list of American dwarf cases to 27, and the deaths thereof, to 20; twelve children were delivered alive. The number of Cæsarean operations in the United States is upon the increase, but their proportionate mortality much more than keeps pace with the growth in number. From April 7, 1884, to April 20, 1885, there were 8 operations, all fatal but the last, and all of the children perished; six of the cases were reported to me by letter. Of the 136 American cases, 58 have not yet been published, and but a very small fraction ever will be by their operators."

ARTICLE XIV.

AN ANOMALOUS HUMAN LUNG, HAVING FOUR LOBES ON THE RIGHT SIDE.[1]

By WILLIAM A. EDWARDS, M.D., Assistant Demonstrator of Clinical Medicine in the University of Pennsylvania; Medical Registrar, Philadelphia Hospital.

MARY O., Irish by birth, æt. 62, widow, mother of four children, came under my care just a year ago, suffering from some slight ailments inevitable at her period of life. The patient's vital powers were at a low ebb, and she finally succumbed to senile asthenia two and a half months after I first saw her. A post-mortem examination was made, not of course to verify the ante-mortem diagnosis, but in the routine line of duty; our work was rewarded by securing this extremely interesting and unique specimen. All the organs were destitute of marked pathological lesions, but upon opening the thorax an unusual condition of affairs was made apparent, well illustrated in the accompanying drawing, in which the lungs are represented as widely stretched apart, increasing the mediastinal

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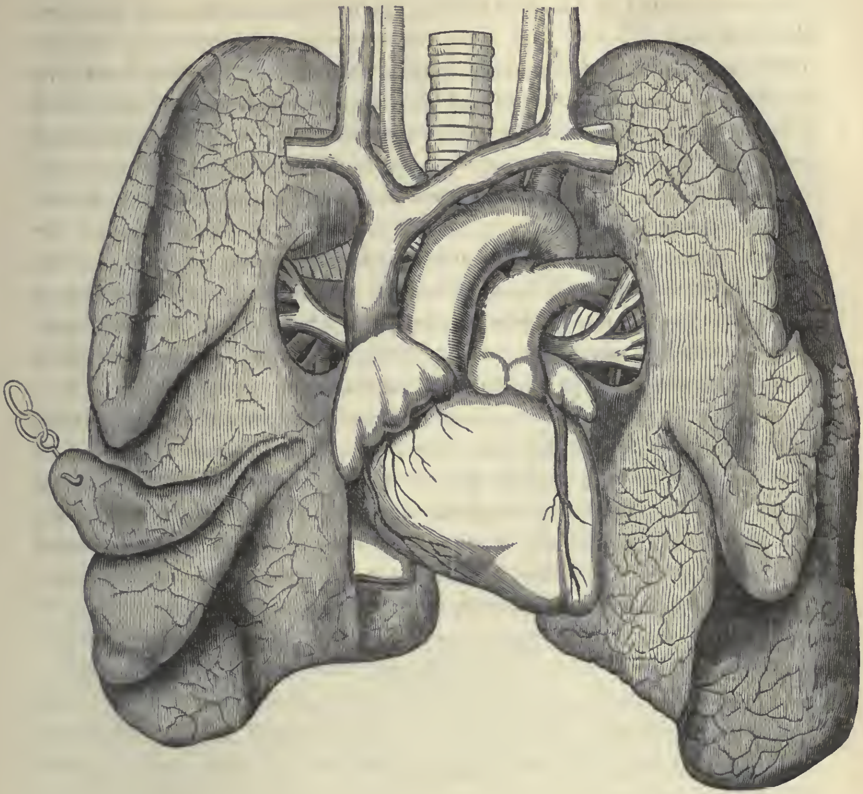
[1] Exhibited before the Philadelphia Pathological Society, April 9, 1885.



space by several inches, thus exposing the heart and great vessels, and giving a better view of the accessory lobe.

The left lung did not deviate from the normal standard, but the right presented *four well-marked lobes*, as shown in the accompanying drawing.

The upper lobe was normal, bearing the proper relative proportion to the remaining parenchyma; the middle lobe was somewhat decreased in size, as was also the lower, and between the two may be seen the anomalous fourth lobe, which was formed at the expense of the second and third lobes together with an absolute increase of lung tissue, as the other lobes are not diminished enough to form the new lobe.

This supernumerary lobe was quite as long as a man's hand from the wrist to the tip of the second finger, measuring from six and a half to seven inches.

At its widest part it measured two and a quarter inches, tapering to a quarter of an inch, and finally to the thin border as in the other parts. Its tissue was perfectly normal and functionally active. Its histological structure was the same as the rest of the lung, and it apparently did its work equally as well.

It is almost needless to remark that no evidence of this condition was revealed ante-mortem, nothing had ever called attention to the lungs, and of course the diagnosis could not have been made even by the most expert and careful diagnostician.

In illustration of the rarity of this anomaly, I am able to cite the following authorities:—

Prof. Joseph Leidy writes me "I have never seen such a lung, nor do I remember having read of one." Prof. William Pepper "has never seen such a case, and recalls no record of one." Prof. William Osler "cannot recollect a similar case occurring under my observation," but sends me a record of the following anomalies:—

"Case I. In which the right middle lobe was only a notch, the lung having but two lobes on the right side.

"Case II. The upper lobe of the left lung was divided by a deep fissure extending internally nearly to the root. Anteriorly to within an inch and a half of the usual fissure. Another fissure was noted in the same lobe three inches from the apex."

It will thus be seen that the left lung in this case was made up of three lobes, the deviation from the normal standard being at the expense of the upper lobe entirely. Dr. H. F. Formad "has seen a lung presenting three lobes on each side, but never one as above described." Prof. J. M. Da Costa "has never seen a similar case." Dr. W. S. Forbes writes that "In a long experience with the cadaver I have never met such an anomaly."

A careful search through a number of anatomical works failed to reveal a like condition, with one or two exceptions, for example, the magnificent work of Braune (*Topographisch Anatomischer Atlas*, Dr. Med. Wilh. Braune, Leipzig, 1875), where a number of thoracic abnormalities are depicted, a case like ours receives no mention. Wm. Cowper (*Anatomy of the Human Body*, London, 1697, Table xxiv.) describes but two lobes to each lung, calling them the right and left anterior lobes, and the right and left posterior lobes. Weckel (*Handbuch der Path. Anat.*, Bd. i. page 479) remarks that Rhodius states that Mollinetta (*Mantissa Anat. Obser. xi.*) once found in a very large man the lungs divided into four lobes like the ruminants. The *Anatomy* of Harrison Allen devotes more space to these anomalies than most other anatomical works, although even here it is but a few lines.

Dr. Collins (On Accessory Lobes of the Human Lungs, by Edw. W. Collins, M.D., *Trans. Royal Irish Academy*, vol. xxv. part vii. p. 329, Dublin, April 13, 1874) records a threefold abnormality in the right lung, pleura and vena azygos. Immediately above the posterior part of the root, in the angle between it and upper portion of the right lung, was to be seen an accessory lobe, somewhat pyriform in shape, with a broad peduncular attachment. Its measurements were four inches in length by two and a half in breadth at its widest part. Breadth of peduncle is one and a half inches. The lobe laid beside and upon the bodies of the five upper dorsal vertebræ in an accessory pleural pouch, which communicated with the general pleural cavity around the peduncle of the lobe. The pleural duplicate was continuous with the costal portion of the pleura above and along its outer border; along its inner border with the mediastinal. Its lower border alone was free; the inner free margin contained the azygos vein, this vein had an anomalous distribution, the course of which it is not necessary to describe. The trachea was separated from the spinal column for a considerable space by the pleural pouch.

H. A. Wrisberg, in 1777, laid before the Royal Society of Göttingen an anomaly similar to the one above recorded. (*Cf.* Observationes Anatomicæ de venâ azygâ duplici aliisque hujus venæ varietatibus, in *Novis Commentariis Soc. Reg. Scient.*, Göttingen, anno 1777, tom. viii. p. 14.) Bouchaud put on record another case before the Anatomical Society of Paris, in 1862.

Lately four instances of accessory lobes above the root of the right lung have been noted by Dr. Chiene in Edinburgh, Prof. Cleland in Galway, and Prof. Wenzell Gruber in St. Petersburgh.

Wrisberg's case is worthy of special note as being the only recorded instance of an accessory lobe of the left vena azygos. Prof. Cleland explains the fact of the accessory lobe appearing on the right side, which appears to be consonant with the development of the venous system as follows: Early in fœtal life from some such cause as a slight adhesion of the lung to thoracic wall, or less probably, an undue curvature of the embryo, the azygos vein as it is drawn downwards at a right angle to its original transverse direction by the descent of the heart, dragged down around it a fold of the pleura, thus deeply notching the lung instead of slipping behind it.

Comparative anatomists, says Collins, from the time of Cruvier, have shown that a fourth lobe upon the right side, which makes its first appearance in many of the quadrumana, is very constantly found in other mammals occupying a defined position, between the pericardium and diaphragm in one direction, and between the inferior vena cava and the spine in the other, a position due to the altered situation of the pericardium.

An accessory lobe of the right lung in man lying below the root on the inner side, and bearing a tolerably strict homology to this so-called lobus impar, which has been regarded by some zoologists as forming a distinctive difference between the lungs of quadrupeds and man, has been made the subject of a memoir by M. Pozzi (*Cf. Revue d'Anthropologie dirigée*, par P. Broca, 1872, p. 443), and was the *only case* on record in man, prior to my describing this *second case.*

A similarily situated accessory lobe upon the left side has been described in detail by Prof. Rektorzik of Vienna (*Cf. Zeitschrift der K. K. Gesellschaft der Aerzte der Wien*, 1861, No. 1). This accessory lobe was wholly isolated from the remainder of the lung, unexpanded, having no connection with the bronchus, though it contained collapsed alveoli, and bronchia lined with ciliated epithelium. It was from a girl who survived her birth only fourteen days.

In Prof. Wenzell Gruber's case besides the accessory lobe of the vena azygos, the remainder of the right lung was divided into four lobes by a cruciform fissure.

Mr. Laurance Humphrey exhibited before the Cambridge Medical Society[1] an abnormal structure, which he had removed from the body of a child a year old who died of tubercular meningitis and acute general tuberculosis. It was lying in the left pleural cavity, in the vertebral groove between the base of the lung and the diaphragm, and was suspended by a thin pedicle of bloodvessels and connective tissue to the descending aorta, from which it received its blood supply. It had no connection whatever with the lung, neither was there any communication with or attachment to any part of the air-passage. It measured about two inches long by one broad; was flattened at the posterior surface, and rounded anteriorly, and had the appearance of a fœtal lung, but was much harder. Sections under the microscope showed lung tissue containing bronchioles lined with columnar epithelium, and thick-walled unexpanded air-vesicles, with a plentiful supply of bloodvessels; also large masses of caseating tubercle with well-marked giant cells.

H. Handford[2] records a case of a man, æt. 40, who died from chronic epilepsy. At the autopsy the following condition was revealed: Lying upon the pericardium and distinct from the rest of the lung about one inch and a half, was a lobe of lung tissue one inch and a quarter long, three-quarters broad, and nearly one-half thick in the centre. It was attached to the anterior margin of the upper part of the lower lobe of the left lung by a double fold of pleura, in which were a few vessels. It was light in color, and not much pigmented. It contained plenty of air. No microscopic examination was made.

300 SOUTH THIRTEENTH STREET, PHILADELPHIA.

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[1] British Med. Journal, April 25, 1885, p. 842.

[2] Ibid., May 2, 1885, p. 926.

REVIEWS.

Art. XV.—*Intestinal Obstruction.*

1. *Contributions to Surgery and Medicine.* Part I. *Intestinal Disease and Obstruction.* By Hugh Owen Thomas. Liverpool, 8vo., pp. 284, with Appendix. London: H. R. Lewis.
2. *Intestinal Obstruction. Its Varieties with their Pathology, Diagnosis, and Treatment.* The Jacksonian Prize Essay of the Royal College of Surgeons of England, 1883. By Fred. Treves, F.R.C.S., Surgeon to and Lecturer on Anatomy at the London Hospital; Hunterian Professor of Anatomy at the Royal College of Surgeons of England. With 60 Illustrations. Phila.: Henry C. Lea's Son and Co., 1884. [Clinical Manuals for Practitioners and Students of Medicine.]

1. The first paragraph of Mr. Treves's preface forms the fittest introduction to our subsequent remarks: "The importance of the subject of intestinal obstruction may be, in one way, estimated by the circumstance that over two thousand individuals die every year in England alone from various forms of obstruction of the bowels, exclusive of hernia."

No one can doubt that the same remarks are more or less applicable to every other civilized country, and that many of these deaths are preventable by appropriate treatment. What this should be is still a mooted question which Mr. Thomas, with his usual characteristic modesty, thinks that he has definitely settled. When reading any of Mr. Thomas's works we cannot help recalling the old fable of the man who refused to remove his cloak at the blustering summons of the wind, who yet almost unwittingly threw it off at the gentle persuasion of the genial sun! The author arouses all the reader's combativeness and sense of fair play by harsh, sweeping, reckless, and scornfully intolerant criticism of the theories and practice of every authority apparently, except Niemeyer, J. H. Murray, *and* Hugh Owen Thomas. The fact that the present is the third edition of Mr. Thomas's book suggests the propriety of a careful study of his teachings. If Mr. Thomas's claims are sustained he is indeed a benefactor of his race; if they are not, overweening self-confidence merits a sharp rebuke.

In the preface to his first edition he stoutly maintains that "hitherto actual non-interference has afforded a better chance of recovery than the treatment commonly adopted. In truth no principles have been laid down for our guidance, and the methods commonly employed are supported neither by reason nor experience. Judging from public clinical records, those gentlemen who have had superior opportunities as teachers or representative men, seem to be farthest astray." He also implies that he may perhaps have used rather intemperate language in attacking the views of others, but seems to think that, because they too in turn have been harsh in their comments, he is excused: this we cannot for a moment admit.

After thus throwing down the gauntlet to all comers, Mr. Thomas proceeds to give a history of the treatment of intestinal lesions from the time of Hippocrates to the present, in which he states that no advance was made in their treatment until Sydenham's advent, who, reasoning from his experience in typhoid fever, "perceived that the same principles of treatment were applicable to intestinal ailments arising from other causes." This advance in therapeutics was a strict attention to dietary, the use of sedatives, and the almost total avoidance of purgatives and enemata.

Some of the details which we shall give may appear to our readers unnecessary and dull, but let them rest assured that they are necessary to do full justice to Mr. Thomas's exceedingly heterodox views.

As an instance of the author's peculiar style of commenting upon the cases of others, he states on page 10, when speaking of the treatment of a case by large rectal enemata followed by abdominal massage, "a presumably sane man kneaded the abdomen." As this case recovered, the "insanity" of the proceeding is not manifest. "The most irrational comments that were ever committed to paper" occurs a little further on. Surely in a sober, scientific discussion such phrases are utterly out of place, and these are only specimens of the numberless ones defacing many a page. Mr. Thomas quotes the discussion on intussusception at the Royal Medico-Chirurgical Society of London in Dec. 1875, participated in by the president and ten members, as one in which "none spoke as knowing anything of any clear principles that could with certainty be followed in the management of these cases." He thinks that the treatment of Mad. Dudevant (Geo. Sand) was "most painful, irrational, and useless," and that "she would have had a far better chance of recovery had no medical aid been sought for her." Having thus given our French confrères their *coup de grace*, he launches out into an historical disquisition upon the treatment of typhoid fever in which Sir Wm. Jenner is held up to reprobation, because his treatment differs from that of Mr. Thomas. The author maintains that diarrhœa should not occur in typhoid fever with a proper fever dietary, *i. e.*, one which "is both food sufficient to maintain life during the disease, and a mechanical remedy that will best keep in abeyance those evil symptoms which indicate the existence of the principal lesion in this fever." Mr. Thomas positively asserts that "milk to be useful should only be poured into the healthy intestine," a statement sufficiently startling to our prejudices in the opposite direction. The possibility of either alcohol or opium producing true stimulation in any dose in any condition of this, or other diseases, is ridiculed. Finally Mr. Thomas quotes cases in support of his views. Cholera is also adverted to, and the treatment of its secondary lesions is brought forward in support of the author's special views.

After this somewhat discursive opening we come to the chapter on the symptoms of obstruction. The diseased conditions are divided into two classes, viz.: (1) obstructions caused by disordered function; and (2) those arising from mechanical agency. In the first are placed enteritis, peritonitis, typhlitis, and perityphlitis, ulceration, perforation, painter's colic, paraplegia, the intestinal lesion of typhoid fever, and Asiatic cholera; to the second division are relegated hernia, stricture, intussusceptions, volvulus, strangulation from adventitious bands or by rents in the mesentery, tumors, gall-stones, and loaded rectum.

Next follows an analysis of general symptoms which it behooves us to consider in detail. "Unusual weight and distension of the abdomen, with or without pain," is a symptom to be considered as a danger signal either before the first attack of obstruction or following it, in which latter event a second attack is impending, and the treatment must be continued. Thirst is variable, being dependent upon the frequency of vomiting. Should this latter symptom be readily controllable thirst diminishes, which renders the prognosis more favorable. When, however, long-continued intense thirst persists, despite the use of remedies, "the prognosis is not hopeful." Not much is to be gleaned from the author's views of the third symptom, "pain," except that when the site of obstruction is below the ileo-cæcal valve "as soon as the accumulation is sufficient to strain the valve, pain is felt here, until the fluid in the small intestine has accumulated in bulk sufficiently to open the valve by pressure upon its upper side when this symptom passes off." It may then perhaps aid in locating the obstructed point the author thinks. We doubt it. Again, cessation of pain with low temperature and a small quick pulse when it precedes collapse *without fecal evacuation*, indicates an almost hopeless prognosis. Upon the condition of a "dry, furred tongue," some most fanciful prognostic points are founded which it is needless to quote.

"Pulse and temperature" are the most reliable points for prognosis. A slowly increasing pulse with a corresponding temperature (?), both of which are "easily corrected by medicine," affords ground for a good prognosis. A "discord" between pulse and temperature means mischief. A rapid pulse with normal or subnormal temperature means impending collapse and indicates the cessation of the use of sedatives. Sometimes collapse with low temperature and a slow nearly imperceptible pulse may be recovered from by the use of stimulants. When Mr. Treves's experience is quoted it will be seen how utterly different his statements are as to pulse and temperature.

Vomiting "when frequent is very distressing to the sufferer. If moderated, however, it becomes a very necessary evil, being, when well managed, a valuable aid to recovery." . . . "(1) The vomiting can and ought to be moderated." . . "(2) Thus a longer retention of liquid within the intestine is secured and thereby thirst is allayed. (3) This extra liquid macerates, and reduces to a semi-fluid state the contents of the intestine above the part involved, and when vomiting occurs, some of the reduced matter is ejected. (4) This liquefaction enables any collection of matter to slip through the diseased or contracted gut before the completion of cure."

If there is much contraction the solids will have to be much liquefied as in an intussusception, if there be only an enteritis less liquefaction will be requisite.

"(5) Again, as Dr. Brinton pointed out, this liquid collecting at the point of occlusion, acts as a fluid dilator gradually enlarging the narrowed part. (6) Medicine cannot totally arrest vomiting before the contents of the bowel are sufficiently reduced, and the intestine sufficiently pervious to admit of some fecal transit. Indeed, could medicine attain that end, it would be dangerous to call in its aid, for so long as the primary difficulty exists periodical relief by vomiting prolongs life, during which aid can be administered; if in obstruction this symptom were absent the patient would die from the ever-increasing distension by fluid." If true, an important diagnostic point as to the site of the obstruction is suggested by Mr. Thomas, viz., that when the vomit is neither stercoraceous in color or odor, the difficulty is in the upper portion of the small intestine. "When stercoraceous in color only, then the obstruction is found in the lower portion of the small intestine or where there is nearly complete occlusion of the ileo-cæcal valve.

When decidedly stercoraceous both in color and odor, then the ileo-cæcal valve is partially obliterated or the obstruction is in the great intestine and the valve is floating.''

The latter remarks may be true for the majority of cases but do not hold good in all, as we have had occasion to observe in our practice.

Many pages with numerous diagrams are devoted to a refutation of Dr. Brinton's teachings as to the causation of fecal vomiting by a "reversed axial current." We believe that in this instance Mr. Thomas is correct, and that reversed peristalsis is a far more important, if not the only, factor.

"Scanty urine" is shown to be of no special value in designating the point of obstruction, since frequent vomiting will prevent the absorption of fluids. In addition the abnormal conditions of the gut as to pressure, etc., also prevent absorption of the fluids which are available.

Under the head of "Abdomen tympanitic," the cause of this symptom is elaborately discussed, and is decided by the author to be due to "retroperistaltic action!" As Mr. Thomas, in the earlier part of the volume, declares that the differential diagnosis of the *varieties* of intestinal obstruction is of no value for treatment, it is no matter for surprise that Dr. Hilton Fagg's excellent differential diagnosis table is entirely ignored.

"Constipation and its recurrence" is exhaustively and concisely treated of, and a clear explanation is given of the mechanism of the so-called "diarrhœa of constipation." The startling statement is made that in "well-managed cases" constipation may vary from five to fifty days, but about thirty-six days is the average duration by Mr. Thomas's methods.

"Collapse and Reaction" are next considered, but nothing of special interest is brought out except the strange fact that collapse may be induced "by the sudden diminution of pressure due to the relief of accumulation through the obstruction."

"Passage of Gas and Feces per Rectum." In every case flatus precedes the discharge of feces by a period varying from an hour to two or three days. If the bowel below the seat of obstruction be empty at the time obstruction occur, after relief of the obstruction the feces are at first pultaceous and then semi-fluid or watery. If the contrary obtains, the first motions may be hard.

A "Secondary Occurrence of Constipation" may take place, or even a third or fourth, each of gradually lessening duration and severity. In connection with this, Mr. Thomas takes the opportunity in a foot-note to call attention to a case reported in vol. lxxxii. 1881, p. 263, of this JOURNAL, where he says the patient was "vivisected," there being "no justification." . . . "in the removed portion of intestine" for an operation, and he concludes by saying that "it would be ironical to term the procedure in this case medical or surgical treatment."

Having carefully read the notes of this case, and not having our eyes blinded by prejudice, we totally differ from the author in his very improperly phrased criticism.

The commencement of "convalescence" the author says is difficult oftentimes to determine, but he asserts, that if when the patient is placed in a recumbent position the abdomen be found to be flattened, or better still, scaphoid, and by manipulation the absence of gas can be determined, convalescence may be fairly considered to have set in, "for gas should not be present when perfect cure has been secured."

From these abstracts it will be manifest that while there are some good points suggested by Mr. Thomas, which should, however, be subjected to further observation and test before acceptance, yet there is a good deal more which is fanciful and vague. The perusal of the original will still further justify our strictures.

In the chapter on the differential diagnosis he points out those affections, such as rupture of aneurisms, abscess, and malignant tumors into the peritoneum, which might be mistaken for intestinal obstruction. Differential diagnosis being so difficult need not be attempted nor is it necessary, the author says. This may be true enough for him, since but one method of treatment is adopted for all cases, but is hardly safe advice for others. The author is certainly the most sanguine of mortals and has the most profound faith in the *vis medicatrix naturæ* that we have yet met with, for he says, "Although I do not know of positive evidence demonstrating that occlusion from fibrous bands can be removed without operative interference, still there are reasonable grounds for believing that this has actually happened." We must emphatically dissent from this view; such cases have recovered because the intestine has been released from the band, not because the band has been "softened, relaxed, or severed by traction." This idea is as baseless as the "airy fabric of a dream."

> Mr. Thomas says: "Costiveness, constipation, or the retardation in progress of the intestinal contents, is an infinitesimal degree of obstruction; this is my opinion. And I also maintain that when we have arrived at a correct knowledge of the natural method of resolution in this trivial ailment, we have grasped the true principles for treating obstructions in general." . . . . "The theory of this natural mode of removal of constipation which I hold is, that the general malaise caused by the constipation tends to alter the proportion between the solids consumed and the liquids imbibed—the imbibition of liquids being increased by thirst, and the consumption of solids being decreased from loss of appetite, the two prominent signs of genuine constipation."

We have now touched the key-note of the volume. Diet is of first importance, and herewith we append Mr. Thomas's dietary.

> "Arrowroot, sago, ground rice cooked with water, with addition of brandy or wine, and nutmeg, with sugar, salt, and butter; pea, lentil, or bran flour, cooked with water, then carefully strained, when butter, salt, and a little pepper are added. For a change I permit any of the flesh broths, these being administered in small quantities as seldom as the thirst and hunger of the patient will permit. All solids and milk should be prohibited. The latter I firmly believe may cause quite as much harm as any solids. Even with this limited diet it is better to underfeed rather than to push the supply, inasmuch as the sufferer, as I have before mentioned, cannot, within the time we are to expect resolution, succumb from lack of alimentation."

Having given his diet we shall be able in a few sentences more to complete the description of the remainder of his treatment. The patient is confined to the recumbent position, but is to lie alternately upon his right and left sides, making these changes only at several hours' interval. All parts of the body should be kept warm but the abdomen, which should remain uncovered. The foot of the bed should be raised ten or more inches "so as to diminish fluid pressure," and "this elevation makes the vomiting less frequent but more copious." By the restricted dietary but little refuse remains, so that the fecal impaction does not increase. To soften and remove that which is already there, the fluids are to be retained by the free use of opiates which diminish the frequency of the vomiting. This latter symptom when frequent, together with pain, is the chief cause of death, so that the sedatives by retaining liquid enable the infrequent acts of emesis to remove the softened feces per orem, which is also aided by the elevation of the foot of the bed. Opiates also diminish the desire and necessity for food, so that the patient can live on a diet so meagre as to produce but little feces. Should the patient sink into collapse, belladonna in large doses is the stimulant which according to the author is most valuable. To this stimulant effect he attributes its success in the treatment of intestinal obstructions, and not to any relaxation of muscular fibre which he is at much pains, here and elsewhere, to prove that this drug cannot effect.

Purgatives are under no circumstances to be used. Opium, regarded as a "*pure* sedative" is to be used in sufficient doses only to relieve pain and restrain vomiting. When the temperature is observed to approach the normal condition, or become subnormal, sedatives must be withheld as collapse is imminent. Alcohol is another "*pure* sedative" which in part may take the place of opium. When the abdominal distension from gas seems a bar to further progress repeated paracentesis is advised. In one case this operation was repeated forty times; when fluid is present with the gas, paracentesis is dangerous. Enemata, tubage, inflation, kneading, and inversion are condemned, not only in the most emphatic but most intemperate terms. In view of the recent experience of some surgeons, it is true that inflation must be used cautiously lest rupture of the peritoneal or all the coats of the bowel occur, but as we have seen the most gratifying results follow these measures, either singly or conjointly, we cannot agree with Mr. Thomas's sweeping condemnation, and his statement that abdominal section is a safer measure. He believes the natural cure by sloughing of the bowel in intussusception safer than a resort to the above measures, which is somewhat astounding, especially in view of the fact that a large proportion of such patients die sooner or later from the secondary results entailed by the sloughing.

Collapse, either present or impending, which is not relieved by atropia, provided it is not due to *relief* of the obstruction indicates an operation, which he advises should be simple gastro-enterotomy. He has never met with "*valid evidence* that any case of intussusception ever required" gastrotomy, *i. e.*, laparotomy.

Forty-one cases are cited in support of his treatment, but the author assures us that many more could be quoted. They include cases of typhoid fever, enteritis, and a very few doubtful cases of intussusception. No cases of strangulation by bands, volvulus, or indeed any cases of acute obstruction seem to have been met with by this author, which may account for some of his extraordinary statements. Let us in charity accept this explanation. In the majority of the cases, permanent recovery ensued in from fifteen days to many months.

We have thus minutely analyzed this book, not because it is so good a one, but because it must reach a large circle of readers. Although the writer is most ingenious and the work is replete with points of interest, from his own cases, we can only render the verdict of "not proven," since they do not include any acute cases of obstruction, which by their recovery would go to prove that the whole medical world is wrong in the treatment of similar cases, and Mr. Thomas alone right. Amid much that is absurd, over drawn, and unscientific, the fact remains that by the measures suggested by Mr. Thomas life may not only be prolonged for weeks of fecal vomiting, but recovery frequently ensue in cases of chronic obstruction. The author is such a thorough partisan that it is but the most ordinary caution to demand confirmation of his results even in cases of chronic obstruction, by impartial observers, before we unreservedly accept his dicta. Certainly his strictures as to the usual "preliminary purge" in typhoid, and the use of purgatives in intestinal obstruction does not obtain as the rule on this side of the water, and we feel convinced that the cases he cites as occurring in England are the very rare exceptions. In conclusion, should Mr. Thomas publish a fourth edition of this work, let us advise him to pay *some* attention to literary courtesy, and remember that presenting a literary pistol to one's head is not the most successful way of convincing a man's mind as to the truth of your statement.

2. While we do not deny that there may be some truth in Mr. Thomas's views, it is a relief to turn from this book to Mr. Treves's little volume, which is most instructive and pleasant reading. The amount of information and practical illustration by cases, drawings, etc., contained in its 450 pages is remarkable. The extent of the subject is such that we can only find space to notice a few points, but we can cordially endorse the work as the best which has as yet appeared on the subject.

Among the many classifications suggested for intestinal obstructions that founded upon their pathological anatomy has been adopted. The influence of peritonitis, strangulated hernia, and mesenteric gland disease in the production of intestinal obstruction is admirably handled in the second chapter. Here Mr. Treves shows that bands extending between parts normally far apart are the result of adhesions produced when abnormally coaptated by excessive gaseous distension, the subsequent traction exerted by the normal intestinal movements elongating the bands. Wide bands of adhesion, subjected to rolling movements of the intestines over one another, are oftentimes converted into cords, and the similar cord-like condition of the omentum which has become adherent and stretched at one or more points, is explainable in the same way. Where adhesions form around slightly mobile parts they may produce obstruction as in the shrinkage of the mesentery in peritonitis deformans. Adhesions on the surface of a portion of fixed bowel, such as the hepatic and splenic flexures of the colon, not infrequently produce marked stenosis of the gut. Adhesions which form a part of the bowel into a rigid loop, may so "kink" the gut as to obstruct its lumen. The adhesion of the appendix vermiformis, of Meckel's diverticulum, and loops of bowels, beneath which other parts of the intestine may be caught, together with strangulation through slits in the mesentery, are carefully described.

The usual forms of peritonitis producing these adhesions are the pelvic, so common in women, the perityphlitis of men, and that following strangulated hernia. Much of interest has to be passed over, but we must mention that adhesions excited by limited peritonitis over a mesenteric gland, the shrinkage following extensive adenitis, and a hole in the mesentery left by the breaking down of a mesenteric gland, have all caused obstruction, and that the just mentioned causes are operative much oftener than is supposed. Strangulation by isolated peritoneal adhesions, by omental cords, by Meckel's diverticulum, by normal structures abnormally attached, and slits in the omentum, peritoneal ligaments and membranous adhesions, forms the subject matter of the third chapter, which is fully illustrated.

We should like to enlarge upon the many interesting points presented by the author, but so much remains to be said that we must pass them by, except the relative frequency of the various forms of strangulation. Thus, of 160 cases, 60 resulted from isolated peritoneal adhesions, 40 from diverticula or diverticular bands, 25 by knots or nooses formed by bands or diverticula, or pressure by an adherent appendix, 20 from slits in the omentum, and 15 from strangulation under omental ligaments. The segment of bowel most frequently involved is the lower portion of the ileum, the anatomico-pathological reasons for which fact seem to us too patent to need further explanation. The rationale of the mechanism of obstruction is next well explained. A mass of condensed information as to the frequency and the reasons for the disproportion between the sexes, of strangulation through apertures and beneath bands, is comprised in the fourth chapter.

Age as a factor is most marked, since it is found that intestinal obstructions from bands, etc., occur most frequently between the ages of twenty and forty, while they are almost unknown in children, because "infantile and tubercular peritonitis are uniformily fatal," while pelvic peritonitis, perityphlitis, etc., are usually recoverable from in adults. Strangulation from true diverticula is most frequent between the ages of 10 and 30. From these facts it will be seen that the previous history as to peritonitis, etc., is of importance in forming a diagnosis. Trouble has arisen from peritoneal adhesions as early as five weeks after the peritonitis and as late as twenty-one years, the average being three years.

A previous history of intestinal troubles is not common, and is unreliable for diagnostic purposes. The onset is sudden, and in subacute cases, as Mr. Thomas points out, the acute symptoms often immediately follow the administration of strong aperients.

Mr. Treves believes that the site of the pain is of no value as a guide to the position of the constriction. Limited tenderness, when well marked, is of considerable diagnostic value, depending doubtless upon congestion or inflammation of the involved coils. Early vomiting which soon becomes stercoraceous is the rule, although the reverse may obtain in the very acute cases, *i. e.*—those who die before the stage at which stercoraceous vomiting usually occurs, and in the more chronic cases. Life is not prolonged on the average beyond the third day after the appearance of feculent vomiting. Constipation, absolute and continuous, is the rule. Exceptionally, a more or less copious motion has been passed just before death, which came from the bowel below the obstruction and was coincident with the appearance of peritonitis. In two instances this was due to a perforation of the bowel above the constriction which probably led to a partial release of the incarceration.

The temperature is commonly subnormal, being that of collapse; and it may even continue to sink when peritonitis has set in. Peritonitis, provided it is not excited by perforation, is commonly indicated by a rise of temperature above the normal in acute strangulation, although this symptom may not be present. Suppression or deficiency of urine does not indicate obstruction of the bowel high up, but is due to nervous influence and the rejection of fluids as is shown by the effect of opium in increasing its secretion. Meteorism is comparatively slight in this form of obstruction, and generally appears about the third day. Coils of intestine are practically never seen through the parietes, the reverse of the condition observed in chronic obstructions. Unless relieved, these cases always die, although a spontaneous relief of the obstruction seems to have occurred in some *very* rare instances.

Chapter fourth is taken up with the consideration of anomalous forms of obstruction, among which we would emphasize that due to the traction exerted by an isolated band which may produce "acute kinking" of the gut, and that adhesion of a small area of the bowel may so interfere with peristalsis, that the slightest inflammatory trouble excited about the adherent knuckle may produce symptoms of acute obstruction. The mechanism is precisely that of a Littre's hernia. The intestine is reduced to an inert tube, and cannot pass on its contents. The symptoms of these kinks, distortions by traction of bands, and matting together either in loops or *en masse*, are in the main those associated with stricture of the small intestine.

Volvulus is clearly dealt with in the seventh chapter, wherein the author shows that it occurs with preponderating frequency in males; that the previous history shows nothing but chronic constipation; that the acute symptoms are sometimes developed by the administration of a purgative, that the vomiting may almost be said in some cases to be absent, and in most, slight; and that still more rarely, absolute constipation is the rule; that severe tenesmus may be present; that death takes place early; and that peritonitis occurs as a rule. The temperature is low, and even on the accession of peritonitis may only reach the normal or a little above it. One of the most conspicuous features, is the enormous gaseous abdominal distension. We regret being unable to enter further into detail here, as to the many surprising varieties of this affection and their causation.

Intussusception is in the seventh chapter shown to be a very common form of obstruction, comprising about three-eighths of the total number exclusive of the congenital obstructions, stenosis of the rectum, and hernia. Rarely found in the duodenum, the most common enteric form occurs in the lower jejunum, then in the ileum. Of the colic forms the ilio-cæcal is far commoner than the ileo-colic. Developmental researches have shown that the colon possesses a long mesentery at one period, which may persist, and that the large gut is always more freely movable in the child than in the adult, which accounts for both the frequency of intussusceptions in the child, and their assuming thereafter the ilio-cæcal form. Many pages, illustrations, and the results of much experiment, are adduced to elucidate the causation of the malady. The author clearly demonstrates the error of the prevalent teaching that a segment of contracted gut is driven into a non-contracted segment below, by "the propulsive action of the intestine." In reality, the uncontracted gut is *drawn* over the contracted segment, the whole process being the result of "irregular action in the muscular wall of the intestine." All practitioners should carefully study these chapters which are too elaborate to admit of a short analysis. More than fifty per cent. of the cases are met with during the first ten years of life.

Especial attention is called to the *intermittency* of the pain, which Mr. Treves contends, both here and in other conditions, "nearly always indicates an incomplete obstruction in the intestine" for when constant and marked by exacerbations the gut is probably completely occluded. "Well localized tenderness is a valuable guide in the absence of tumor, as to the site of the intussusception." Feculent vomiting it should be noted does *not* occur in more than twenty-five per cent. of acute or subacute cases. Constipation is the rule towards the end of the disease. It is a remarkable fact, that in intussusception, unless there is much shock, the temperature is normal or may be *above* the normal *without peritonitis*, so that slight pyrexia should not be in itself considered proof of even incipient peritonitis. A recognizable tumor is present in more than one-half of the cases, but may only be detectable *when the abdomen is examined during a paroxysm of pain.* In one rare chronic case there were good reasons for thinking that the duration was over a year.

When speaking of spontaneous cures, the author demonstrates the folly of Mr. Thomas's argument for delay, by showing that even of the few who survive the immediate effects of elimination by gangrene of the bowels, 40 per cent. eventually die. The section on stricture of the bowels is good, but contains nothing specially noteworthy, except that auscultation at the seat of obstruction during the administration of an enema is considered of great diagnostic value.

Tumors of the bowel producing obstruction, and compression effected from without by morbid growths of other viscera are carefully considered. It is shown that foreign bodies may by their lodgement produce obstruction, but that this is seldom the case. Of the various portions of the alimentary tract where arrest may occur viz., the stomach, duodenum, the lower end of the ileum, the cæcum and the rectum, the cæcum is said to be the one in which lodgement is most likely to occur. Sex is of diagnostic value where the occluding body is supposed to be a gall-stone, since females are nearly four times as frequently affected as males. The patients are usually beyond middle age : in only one case was the patient less than forty years of age. Acupuncture for diagnostic purposes is condemned unless a distinct tumor can be felt. Enteroliths rarely become a source of permanent obstruction, as they are either spontaneously evacuated or removed from the rectum.

Ileus paralyticus is described as a condition where owing to previous constipation, either as cause or result, the peristaltic movements have become so feeble that complete fecal obstruction occurs rendering a segment of the bowel utterly incapable of exercising its motor functions. These being rather medical than surgical cases, their consideration need not detain us. Without reproducing the actual words of the author, no fair idea of the chapters upon diagnosis can be given, and we shall therefore confine our remarks to a few salient points. As we have said before, we think that Mr. Thomas has demonstrated to a great extent the inaccuracy of Dr. Brinton's teachings as to the reversed axial current, which Mr. Treves thinks is amply sufficient to account for fecal vomiting. Mr. Treves remarks that "it is doubtful whether any ailment of an equally common nature has been the subject of so many errors in diagnosis" as intestinal obstruction. If, however, some of the wise advice of the author be borne in mind, we think mistakes will become less common. Thus he says, that a previous history is often a complete elucidation of an obscure case, and that *repeated* examinations of the abdomen should be made, for "it is absurd to suppose that in any given case all information derived from an examination of the belly is likely to be obtained during one isolated inspection." In acute attacks supervening upon chronic ones, coils of distended intestine may be seen through the thinned abdominal walls, a symptom which is absent in primary *acute* obstruction. The site of pain is not often of value since it is so often referred to the region of the umbilicus, doubtless from irritation of the peripheral branches of the superior mesenteric plexus. Enemata and the passage of the long tube are valueless for diagnostic purposes, but auscultation during the use of the former is looked upon with favor.

One of the most valuable portions of the work is that dealing with "pseudo-strangulation" and the affections liable to be confounded with intestinal obstruction. With regard to the former condition, Pflüger's experiments afford a rational explanation. He found that mechanical irritation of the skin of the abdomen would arrest the movements of the small intestine. Now this skin is supplied by certain dorsal nerves whose main trunks also send branches to the splanchnic nerves. Clinically, a phlegmon of the abdominal walls, an inflamed testicle, an inflamed hydrocele, etc., have produced all the symptoms of strangulation so as, in an instance of the latter, to mislead even Dupuytren.

The subject of treatment is ably handled. In acute and subacute cases nourishment must be administered by the rectum unless it increases the pain and vomiting, as it sometimes does. Opium is of immense value, and under its free use many cases of acute intussusception have yielded in their early stages. Still it must be used with caution lest it mask the danger, the best rule for its exhibition being to give the drug as we should for strangulated hernia. Aperients are utterly condemned in the acute and subacute cases, but in fecal accumulation, given with care and aided by enemata, they may prove valuable. "In many cases of chronic intussusception the occasional and cautious use of gentle laxatives is of much service as a palliative measure." Recent observations *seem* to show the occasional advantage of metallic mercury in purely fecal accumulations, but its usefulness is not due to the weight of the metal but to the disintegrating action of its minute particles which insinuate themselves throughout the mass. Massage alone is useful chiefly for chronic fecal accumulation and the dislodgement of foreign substances, but is of very limited applicability. Enemata are probably only of value for trouble involving either a part, or the whole of the large intestine. Contrary to Mr. Thomas's positive assertions, Mr. Treves shows that in certain cases of stricture, etc., of the colon water will easily pass from below upwards, but not from above downwards without much difficulty, owing to the valve-like nature of the obstruction, so that enemata may dissolve and break down fecal accumulations thus circumstanced. Insufflation and entero-centesis are considered, the latter not being regarded with much favor. Laparotomy is exhaustively treated of, but we cannot do more than mention this chapter with the highest commendation for its thoroughly practical character. Primary enterotomy is disapproved of, but may become necessary after lumbar colotomy when the site of stricture is above the opening in the large gut. Much good advice, founded upon personal experiment and operative experience, is given as to enterectomy and colectomy. Owing to the time consumed by such operations, and the exhausted condition of the patient, together with the probable diseased condition of the bowel, primary enterectomy for obstruction followed by immediate suturing of the gut, is not generally advisable, but the diseased mass having been removed or the gut simply opened an artificial anus is to be established, and then after a time a successful suturing of the bowel can be undertaken. This rule is not applicable to resection high up in the jejunum lest inanition ensue.

The final chapter deals with the special treatment of individual forms of obstruction, and to it we must refer the reader for details. A full index renders the book doubly valuable.

This work serves as an admirable foil to Mr. Thomas's book. Mr. Treves has no special treatment peculiar to himself that is appropriate for any and every case disregardful of the experience of others, but, with a truly catholic spirit he has brought together all that pathology, physiology, experiment, and best of all, experience, can offer to help us, all being tempered by the judicious commentaries of one who has himself doubted, failed, and finally succeeded in reaching firm ground whence he offers to us a helping hand.

No one can afford to be without a copy of this book, and we can unhesitatingly recommend it as by far the best work that has ever appeared upon the subject of intestinal obstructions. C. B. N.

ART. XVI.—*Saint Thomas's Hospital Reports.* New Series. Edited by Dr. SEYMOUR J. SHARKEY and Mr. FRANCIS MASON. Vol. XIII. 8vo. pp. xiii., 526. London: J. & A. Churchill, 1884.

THE Saint Thomas's Hospital Reports is always a welcome visitor, and the present volume is doubly so from the variety of the papers and the carefully compiled reports of the various departments of the Hospital. As in last year's volume there is a marked preponderance of medical over surgical papers.

Under the caption of *Notes from the Laboratory of Saint Thomas's Hospital*, Mr. BERNAYS contributes some careful analyses of milk, "stale and fresh," to establish "the thesis that it is impossible on the results of an analysis of sour milk to establish the nature of a milk when fresh." To this paper is added a note containing the analyses of milk in two cases where the milkmen were summoned before a magistrate for "watering." The results of a double analysis, by Mr. Bernays and by the Somerset House chemists, fully bears out the thesis which the former lays down.

Mr. BENNETT's interesting paper on *Vegetable Growths as Purifiers of Sewage*, ought to excite considerable interest. The notes are based upon an examination of vegetable growths in the tanks of the Hertford Sewage Works. Mr. Bennett regards the growth of the "sewage-fungus" as an "undoubted evidence of the presence in the water of an abnormal amount of sulphates in solution, derived either directly from sewage, or from the substances used in precipitating it." It apparently has no injurious effect upon the water; abundance of live fish have been taken from the channel, and, in the opinion of Mr. Bennett, if the fungus "be allowed to accumulate and be periodically removed, it may tend to purify the water by abstracting from it some of the undue proportion of sulphur." Mr. Bennett finds four varieties in the growths found in the water: 1, an olive-green substance, consisting chiefly of large masses of oscillaria in a more or less completely decomposed state; 2, green algoid growths, consisting of various Confervæ and Cladophoræ, together with large quantities of the animal life usually met with in running and stagnant water; 3, a brown floating matter generally found in patches on the effluent water, and made up of highly carbonaceous vegetable matter more or less decomposed; and 4, large masses of grayish-white flocculent substance, the "sewage-fungus" referred to above; the whitish masses found to be composed of "immense quantities of filaments of an organism identified as *Beggiatoa alba*, Vauch, or a closely allied species." This organism has been carefully studied by German observers, and further notes from an English standpoint will be looked for with great interest.

Dr. KILNER's paper on *The Effects of Electricity upon the Circulation, Local and General,* is the result of a large number of careful experiments, with a practical exemplification in two cases, one of severe neuralgia in the knee, where the temperature of the two sides was not equal, and where the constant current gave temporary relief; the other, a case of congestion of the hand due to an affection of the musculo-spiral nerve; the application of the induced current removed the congestion, and the general muscular tone began to improve. An excellent plate of seven figures illustrates Dr. Kilner's paper.

Dr. SHARKEY contributes the reports of *Two Cases of General Atrophy treated by the "Weir Mitchell" Method*, which is an interesting exposition of the benefits following the use of the "rest cure" in a certain class of cases to which the two which he uses as a text belonged. All the elements of the treatment laid down by Dr. Mitchell, and made familiar to the profession in England by Dr. Playfair in his little book on the "Systematic Treatment of Nerve Prostration and Hysteria," were carefully followed out. Absolute retirement and rest, massage and electricity, and a careful attention to the diet constituted the only treatment, and with entirely satisfactory results. Dr. Sharkey gives also careful reports of the weight of the patients taken from time to time, and a specimen of the dietary table. The paper is admirable and comprehensive, and does not need the half-apology for the triteness of the subject with which Dr. Sharkey presents it to the reader.

Dr. CARPENTER's paper on *Common Catarrh, Sewer, and Sore-throat* is a contribution to the study of epidemic diseases, resultant upon investigation of emanations from a sewer close to his own residence. These emanations in the winter could be clearly seen in the form of a vapor rising (from a ventilating opening) "in a gentle steamy form, and when this vapor has been collected upon microscopic slides smeared with glycerine it has showed under high power (together with other spores) very minute organisms with a high refracting quality, similar to the micrococci of Hallier and Cohn, forming short chains and colonies taking the form of zooglia." Dr. Carpenter has noted also that endeavors to collect the micrococci always has had a similar effect upon himself, and has led him to name them Cacozymes. He describes his sensations as follows: "Twelve hours after exposure I had a relaxed feeling in the throat with a frequent desire to swallow, which action was on the following day slightly painful. Inspection showed the uvula somewhat relaxed, and the mucous membrane of the pharynx slightly congested. The nasal passages became dry, and the conjunctiva slightly reddened. Thirty-six hours afterwards there was a free flow of acrid water from the nose, a general feeling of malaise, and a slight hoarseness, and in forty-eight hours a discharge of mucus from the throat, slight laryngeal cough, and the usual conditions of catarrh. The symptoms followed a common course. There was a slight bronchial irritation, no loss of appetite, and gradual disappearance of the relaxation of the throat, and increased discharge of mucus, and restoration to healthy feeling in about five days." Dr. Carpenter invariably noted a peculiar odor in the vapory emanation; he describes it as a "sweet, bad hay-like smell," such as he has occasionally perceived emanating from patients "dying of a certain form of kidney disease," and he adds that every attempt to obtain microscopic evidence from the ventilator was always attended by the symptoms described above when that particular smell was present. On one occasion he found micro-organisms in the discharge from the pharynx, similar to those detected upon the glycerine slides. It is further noted that "the smell in question is never found when the place is free from catarrh, and catarrh has always abounded among the people when there has been distinct emanations from the opening."

Too much cannot be said in commendation of the admirable reports of a series of *Cases of Tubercular Meningitis*, contributed by Dr. BRISTOWE. This series includes ten cases, of which full notes are given, and post-mortem examinations of all the cases having been made, good reports of these are appended. In three of the cases "the meningeal affection was obviously secondary, as it almost always is, to tubercular disease of the thoracic or abdominal organs. But the interesting point in relation to this association here is that either the primary tubercular disease had apparently become retrogressive if not cured, or that at any rate its symptoms had subsided, and from a clinical point of view a cure had been effected." In three other cases the growth of tubercle was comparatively slow, and definite symptoms developed only when inflammation became superadded. Two other cases were instances of the supervention of tubercular meningitis in cases of imbedded tumors of duration, respectively twelve months and three months before the onset of the meningitis. The ninth case was interesting from the fact that there was "tubercular meningitis attended with quite characteristic symptoms, while no trace of tubercular disease was discovered in any other part of the organism." The tenth case is noted because of the resemblance of the symptoms to those of delirium tremens. A general view of the symptoms presented by these ten cases is of great interest. In four of the patients, optic neuritis was present, in six there was paralysis, in only three were there convulsions (in one they came on a few hours before death, in one the day before death, and in the third three days before death). The temperature varied remarkably: "In one case it never rose above 100.8°, and sank to 94° just before death, at which time the pulse was 90°. In one the variations were between 100° and 103.4°, but it sank to 98° at the time of death. In another it ranged from 99.2° to 102.6°; but fell during the last two days to 95.2°, it being 95.4° just before death; at which time the pulse (which had been 132) fell to 66. In another case the temperature varied from 101.2° to 102°, the pulse generally varying from 72 to 88. Before death the temperature was 102.2°, the pulse 140. In another case the temperature lay between 102° and 103°, and reached 103.6° at death; the pulse which was 76 on admission, rose gradually to 160. In another the temperature was 104.2° shortly after admission, but varied during the rest of the patient's life from 99.2° to 100.5°, the pulse varying from 75 to 92. In a child of two years the temperature ranged between 96° and 99° and the pulse was about 66. But the day before death the temperature began to rise, and at death it had reached 109°. The pulse was 132 when the temperature was 102°. In another instance the temperature was generally between 100.6° and 101.8°, but it rose rapidly at last and just before death reached 107°. When it was 102° the respirations were 55 and the pulse 189." These differences are inexplicable, and it is noteworthy that in some cases the temperature should have fallen rapidly upon the approach of death, whilst in other it rose rapidly and in one case as high as 109°.

Dr. SEMON contributes to this volume a valuable synopsis of the cases treated in the *Throat Department in* 1883. This includes formal reports of a number of interesting cases, and a section upon the Indications for and Methods of Removal of the Tonsils. Dr. Semon recommends that the tonsils should be reduced in size under the following circumstances: "(1) If they interfere with respiration during waking or during sleep, and lead to insufficient oxygenation of the blood. (2) If they lead to changes in the character of the voice, and to defective articulation. (3) If they lead to defective development of the face and chest. (4) If the chronic enlargement, though not very considerable, be attended by frequent attacks of inflammation of the tonsils themselves, by tumefaction of the cervical lymphatic glands or by catarrhal conditions of the neighboring mucous membranes, notably of the Eustachian tubes." Of course the coëxistence of adenoid vegetations with the hypertrophic tonsils is a necessary restriction concerning the general validity of these indications. With regard to the method of removal, Dr. Semon takes this position: "(1) If the patient be under twenty, and the enlargement mainly involves the transverse diameter, so that the tonsil or tonsils project a good deal beyond the arch of the palate, I avail myself of a cutting operation. (2) If the local conditions be the same, but the patient be above twenty, I give the patient the option between the cutting and the galvano-caustic operation, explaining to him fully the advantages, disadvantages, and risks of both methods. (3) If the tonsils, however large, and however productive of serious consequences, are entirely concealed behind, or only little projecting beyond, the palatinal arches, I proceed by galvano-caustic operations, whatever the age of the patient may be." Dr. Semon's whole report, and especially this section of it, is well worth careful study.

Dr. HUTTON's contribution on *Mediastino-Pericarditis in Children*, includes the reports of several interesting cases with the autopsy in one.

Under the caption of *Hammam R'Irha, a Winter Health Resort*, Dr. SAVILL gives a pleasant account of an Algerian bath station.

In his paper entitled *Cases of Ulcerative Endocarditis*, Dr. PERCY SMITH adds the histories of eight cases to those reported by Dr. ORD and Dr. GULLIVER in the last two volumes of the Reports. The peculiarities of cases noted by Dr. Smith can be seen in the following brief summary: In only one case was the disease associated with acute rheumatism upon admission, whereas in five the acute process clearly supervened an old standing cardiac disease. In two of the cases in which there was no previous history of rheumatic fever there was a history of injury, in one only a week, in the other fifteen months before the commencement of symptoms. No case was associated with acute pneumonia, and in only one was there evidence of renal disease on admission, and that with a previous history of scarlet fever. With regard to the *post-mortem* appearances, "four of the eight cases had hemiplegia from embolism of the middle cerebral artery. In three the hemiplegia was left-sided; in one large embolic masses resembling exactly the vegetations in the heart were found in the femoral and superior mesenteric arteries."

Egypt is well represented in the reports, having no less than two articles devoted to a discussion of its sanitary matters. One entitled *Sketches of an Egyptian Cholera Hospital*, is contributed by Dr. ACLAND, the other on *Medical Matters in Egypt* by Dr. F. M. SANDWILTS.

Dr. TYRRELL describes some new and improved anæsthetic apparatus, with which he uses Regnaud's anæsthetic mixture. The advantages claimed are that only a very small quantity of the mixture need be used (one drachm sufficing "for seven or eight dental patients taken one after the other"), that the administration is so gradual that cardiac failure is extremely unlikely to occur, and that vomiting is extremely rare, Dr. Tyrrell having only noted one instance out of 200 cases.

The *Report of the Department for Diseases of the Skin* is furnished by Dr. PAYNE, and includes excellent summaries and detailed instances of some of the rarer and more important cases which came under observation, and notably one of xanthelasma multiplex.

The *Report of the Obstetrical Department* is edited by Dr. DUNCAN, and the *Medical Report* by Dr. HADDEN; both are carefully prepared and well worth study. R. P. R.

The first surgical paper in this volume is one by Mr. F. LE GROS CLARK, entitled, *Some Records of Surgical Experience*, which is a continuation of one in a former volume. This paper is made up of a number of brief expressions of opinion on the part of the author, founded on his personal experience. It includes his views in regard to such minor details as the treatment of warts, ingrowing nails, and abscesses of the tonsils, and of such general matters as the influence of food and drink on health and longevity. In connection with the treatment of chronic abscess, there is a good suggestion to make a small opening at a dependent point, to allow as much pus to escape as will naturally come away, and then to apply an elastic bandage, in such a way as to gradually compress, empty, and obliterate the abscess cavity. Drainage tubes the author has no faith in, believing that they do more harm than good. His treatment of nævi is to cut up the substance of the tumor with a tenotomy knife, introduced subcutaneously, and then to cauterize the interior thoroughly with nitrate of silver melted on a probe. He is opposed to the free incisions sometimes practised in the treatment of carbuncles. In the treatment of erysipelas, he does not think the morbid process can be limited by the application of nitrate of silver, but that the cases so reported must be cases of simple erythema, which is amenable to this method. In the treatment of stricture of the urethra, Mr. Clark prefers gradual dilatation, which, when it succeeds, he thinks gives more lasting results than any other method. Where it does not prove successful, he uses caustic (potassa fusa) pressed against the face of the stricture till it passes through it.

A very interesting and useful part of this paper is devoted to the consideration of the pulse, temperature, and tongue, as indexes of the condition of the patient. We cannot dwell upon his details, but we feel that there is sometimes a gap in the treatment of surgical cases which would be well filled if more consideration were given to what might be called the medical aspect of the case, and so we feel that such records of personal experience as we have here have a peculiar value. For the treatment of hemorrhoids (presumably internal hemorrhoids), Mr. Clark is a believer in the ligature. The author in speaking of burns, mentions an interesting case, in which he thought he could circumvent nature, and overcome the tendency to contracture by making a support for the arm which had its *point d'appui* upon the chest wall. The result was curvature of the spinal column; a result which will bear thinking over before one may feel sure of having rightly comprehended its mechanism. On the great tobacco question Mr. Clark is temperate. He believes that in most cases the moderate use of tobacco is beneficial. In regard to fractures of the neck of the thigh-bone, he does not accept the common explanation of their causation by a slight trip or false step, but thinks that the trip is caused by feebleness, and the fracture by direct violence to the trochanter in the fall.[1] Some space is given to discussing the nature and effect of railroad injuries, which have attracted so much attention of late in Great Britain. In regard to these, the views of the author are conservative. He makes also some interesting suggestions as to the effect of habits associated with daily railroad travelling, and the way they may simulate or lead to injury.

Mr. John R. Lunn has an interesting paper, giving a description of a case of *Osteitis Deformans*, with six plates, which add very much to its value. This paper must be examined in order to get an idea of its character, and will repay perusal.

Mr. Charles E. Truman, Assistant Dental Surgeon to the Hospital, has a paper on *A few Cases of Broken Jaw.* This is a sort of an emulsion of dental and surgical therapeutics. The surgical part is trite enough, and so, for that matter, is the dental. The writer has made a slight modification of the old trough splint which seems to be an improvement. But surgeons rarely have use for these apparatuses which demand the employment of an instrument maker.

The next paper, by Mr. Walter Edmunds, on a *Case of Gastro-Colic Fistula*, is short, but very interesting. The patient had suffered for some time with symptoms which we wonder did not suggest the presence of cancer in the stomach or an adjacent organ. Upon his admission to the hospital a diagnosis of gastro-intestinal, and probably gastro-colic, fistula was made by Dr. Bristowe, who had previously seen a similar case. A few days later Sir William MacCormac performed the first part of right lumbar colotomy, following it in four days by opening the gut. This led to no improvement, and three days afterwards the patient died. The fistula was found, at the autopsy, to be the result of ulceration of a cancerous mass which connected the stomach and the transverse colon. The paper contains some interesting remarks on the subject and reference to several other cases.

Mr. G. H. Makins contributes a valuable paper on *A Case of Artificial Anus treated by Resection of the Small Intestine.* The fistula followed a completed operation for strangulated inguinal hernia, an attempt to close it having been made before doing the operation which is the subject of the paper. For this operation the patient was prepared by confinement for two days to liquid diet, and by receiving irrigations of the upper end of the bowel with salicylic lotion. At the operation about three and a half inches of the intestine was excised, with a corresponding wedge of mesentery. The two edges were united with a first row of twenty-five very fine China-twist sutures, passed with a small curved needle, such as is used for suturing the sclerotic. These sutures were passed through the whole thickness of the gut, about a tenth of an inch from its free edge, commencing at the mesenteric border. They were tied in batches of five at a time, and then the second row of Lembert's peritoneal stitches was passed in the same manner. During the stitching, which occupied about three-quarters of an hour, the intestine was kept moist with warm salicylic lotion. An important step of the operation consisted in drawing the bowel out of the abdominal cavity, and isolating it by packing small sponges around it before it was divided. The wound was dressed with powdered iodoform, iodoform-gauze, and a pine-wood bag. Healing progressed almost without interruption, though there was a short attack of congestion of the kidneys, with hematuria. The plain and succinct account of this operation and its happy result is followed by some instructive remarks upon the subject in general, and two tables: one containing 39 cases, collected by Mr. Makins, of similar operations for artificial anus, and the other containing 55 cases of the same operation for gangrenous hernia. Mr. Makin's study has led him to the belief that, while the operation of resection has been followed by a relatively greater number of deaths than the operation with the enterotome, this disparity is to be accounted for partly by errors in *technique* in the former method, which can be corrected, with improvement in the ratio of recoveries. In the matter of success, the operation of resection is ahead of the enterotome operation, while it is a very much less tedious method. Mr. Makins formulates his conclusions as follows :—

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[1] A case strikingly confirmatory of this opinion happened in the practice of the reviewer very lately.

> "The rules to guide us in these cases as deduced from the above statistics would seem to be the following:—
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> "1. When no projection of the mesenteric border exists, a temporary tube, either of silver in two halves separable by a screw, or of India-rubber, should be tried, and if after a sufficiently prolonged trial a satisfactory passage is (*sic*) established, a secondary plastic operation may be resorted to if necessary.
>
> "2. When both openings are readily found, but the passage of intestinal contents into the lower one is prevented by a 'spur,' Dupuytren's enterotome followed, if necessary, by a plastic (*sic*) may be tried.
>
> "3. If either of the former methods have failed, if the lower opening is (*sic*) not to be found, or from the height of the fistula in the intestinal tract the patient is (*sic*) emanating rapidly (since the average duration of Dupuytren's method varies from four months and a half to one year), resection is indicated. The application of the clamp is unsafe before the end of the second month subsequent to the formation of a fistula, since prior to that time the adhesions are not firm enough to bear interference without danger."

These conclusions seem to be warranted by the facts collated by Mr. Makins, whose paper is a valuable contribution to the literature of this subject, and incidentally to the subject of operation for gangrenous hernia.

The last surgical paper is a short account of *Four Cases of Symmetrical Development of Fat at the Back of the Neck* by Sir WILLIAM MACCORMAC. The paper is illustrated with seven excellent wood-cuts, contains a number of interesting facts in regard to these growths, which are apparently not so rare as one would imagine. Incidentally we find a strong indorsement of the wood-wool dressing, rendered antiseptic with corrosive sublimate, which seems to be much used in St. Thomas's Hospital.

We now come to the *Statistical Tables* for the year 1883, which, while having a dry look at the first glance, are full of interest, and may be made to yield much instruction. In regard to some of these we shall be compelled to record some criticisms, as, for example, the record of a case of hydrophobia, so called, from the bite of a cat, about the diagnosis of which we have some doubts. We object also, as we have done in a review of a previous volume of these Reports, to the use of the expression "soft sore" to designate the chancroid; and are surprised at the classing of sarcomata and four-fifths of the cases of syphilis as cured—about both of which it would be interesting to know how the fact of cure was established in the space of less than a year. Then we wonder that the injuries of the spinal cord—myelitis and concussion—should be called injuries of the "*spine*." Of course, "paralysis of the musculo-spinal nerve" is a printer's error;

but what a singular mode of progression is indicated by the insertion of an operation for necrosis of the inferior maxilla among operations upon the "*locomotory* system." It is a matter for regret that the figures for aneurism—popliteal 3, femoral 1, with 2 recoveries and 2 deaths—do not indicate which died. It is curious also to note that a case of osteitis deformans, the patient, being between 40 and 50 years old, was relieved (if we understand the abbreviation R.) in a period of time between five and thirteen days. Again, it is rather remarkable that of five cases of gangrene, three of which were senile, only one died. It would be interesting to have more details of these cases, and to know more than a scrutiny of the table of operations seems to indicate, namely, that in one of these cases a "Pirogoff" amputation of the foot was performed, and was followed by recovery.

In the treatment of hemorrhoids (there being no indication as to whether they were internal or external, though presumably the former) we see that 14 cases were treated by clamp and cautery, 4 by ligation, and 1 by clamp alone.

A study of the special tables, which follow the general statistics, is as interesting as instructive. The operations for vesical calculus, for example, show the exceedingly bad result of three deaths in eight operations of lateral lithotomy. In view of this appalling mortality we would suggest to our British brethren to study the available statistics and present standing of the supra-pubic method, with which they seem to be less familiar than the surgeons of any other civilized nation. When eminent Continental surgeons, and some even of their own number are coming to the conclusion that the future of stone operations will belong to this method and to that known as "Bigelow's," it is high time that those who think differently should have better backing for their opinion than a mortality of more than 33 per cent. in the method they select. In this connection we observe that the weights of the calculi are not given in the report, and that it is impossible to tell how soon the deaths occurred, or how long delayed were the recoveries, both of which data have a very important bearing upon the merits of any operation.

When we turn to the statistics of joint-diseases, the results are seen to be much better than those in stone cases. Of 79 cases of hip-joint disease, 24 are set down as cured, 51 as relieved, and only 4 as having died; of 63 cases of knee-joint disease, 23 were cured, 35 were relieved, 1 was unrelieved, and 4 died; of thirteen cases of ankle-joint disease, 8 were cured, 6 were relieved, and 1 unrelieved (a specimen of mathematics which we cannot comprehend, and which we cannot make correspond, even approximatively, with the figures in the tabulated statistics).

The matter of fractures of the cranium is of great interest to surgeons, so it will be pleasant to find that at St. Thomas's, out of 27 cases of fracture of the base of the skull only 10 died, while 15 were "cured," and 2 were "relieved"—whatever that may mean. It is a pity that the limitations of a report of this kind do not permit the giving of more details about these important injuries, as, for example, the nature of the accident and an exact description of the fracture, which would contribute to a determination of the mechanism of fractures of the base of the skull.

Among the injuries of the lower extremity there are several cases which illustrate how serious injuries may be followed by recovery. In one of them, a girl, fifteen years old, who fell from a window, there was much comminution of the lower third of the left femur, with a small wound, the fracture extending into the joint; there was also a fracture at the junction of the epiphysis of the right femur with its shaft, and slight separation of the condyles with comminution of the outer one, in addition to an incomplete fracture of the lower jaw, and shock. This patient made a good recovery, and had good motion with no difference in the length of the limbs—which is certainly a triumph of conservative surgery. There are three cases of fracture of the neck of the femur noted, all on the right side, and all impacted.

The special table of the cases of hernia is disappointing, partly because it is hard to see the reason for calling some of them cured and others relieved. For example, how could it be said that a strangulated inguinal hernia of twenty-four years' standing was cured by a warm bath? And how, on the other hand, was there no cure in the case of an infant three weeks old, who would certainly be regarded as a more hopeful subject? These anomalous conclusions make it hard to determine exactly what inferences are justifiable from the statement of results in this table, although the probability is that all the cases not operated upon for a radical cure ought to have been classed as relieved. One inference of decided value seems to be warranted by the statistics given, namely, that ice will often make a hernia reducible which has resisted other measures; another is that the operation of opening the sac is not without grave dangers in this hospital, for two out of nine patients so treated died.

The special table of cases of pyæmia presents some curious illustrations of the eccentricities of surgical phenomena. Here, for example, is a man who died of pyæmia after an injury of the finger, followed by suppuration and necrosis of a phalanx. A woman, admitted three months after confinement, was suffering with pyæmia, and was dismissed as cured only after 195 days. A female infant, nine months old, was admitted with apparently spontaneous pyæmia, and died in four days. Another girl, eleven years old, was admitted as a case of rheumatic fever, but had pyæmia, due, apparently, to necrosis of the femur. A boy, six and a half years old, had disease of the tarsus and pyæmia, and died suddenly, two days after admission, with pericarditis and *rupture of the left ventricle of the heart.* The last case to which attention will be directed was one of large popliteal aneurism, in which, after digital compression for seven hours and three-quarters, gangrene ensued, for which an amputation was performed five days later, which was followed by pyæmia and death in eleven days.

It appears, from this report, that the "Antiseptic Method" has some failures in St. Thomas's Hospital. For example, here is a case of amputation in a man twenty-seven years old, through the lower third of the thigh, for knee-joint disease, done under the spray, which was followed by carboluria, pyæmia, and death in nine days. Another case, of a boy five and a half years old, from whose back a large fibro-lipoma was removed "with antiseptic precautions," the dressings being of carbolic acid solution, carboluria, pyæmia, and death followed in the space of eleven days. Again, we find a woman, forty-five years old, whose breast was amputated for a chronic induration with sinuses, and dressed "antiseptically," until one day when it is noted that solution of chlorinated soda was substituted for the antiseptic dressing, there being a well-marked erysipelatous eruption on the chest around the wound." The end was, nevertheless, pyæmia and death.

In concluding this review we desire to express, as we have done before, our appreciation of the difficulty of compiling accurate statistics in a large hospital, and also of the fact that it would be unreasonable to expect that the Surgical Registrar of St. Thomas's Hospital would, or could, make up his tables so as to satisfy all his critics. But we are prompted to point out what appear to us to be defects in this report in order to show that there are those who find it and its like worthy of careful study, and who would be glad to get more, and more precise, instruction from a source whence they already derive so much. Taken as it is, the volume before us contains a rich mine of facts, which cannot fail to repay the toil of any one who will dig into it. C. W. D.

ART. XVII.—*Transactions of the American Ophthalmological Society. Twentieth Annual Meeting.* 8vo., pp. 764. Boston, 1885.

THE first paper is by Dr. H. DERBY, of Boston, who discusses the value of *Iridectomy in Chronic Iritis*, as illustrated by a case that afforded unusual opportunities for testing it. This operation, originally proposed by Von Græfe for cases of total synechia, has since been extended by some surgeons to cases of chronic iritis with manifold points of adhesion, with a view to a therapeutic, or rather preventive effect upon the disease.

In the case reported by Dr. Derby, the disease recurred with remarkable frequency, but was generally of a mild character and yielded readily to atropia. The patient, a lady of 60 years, was seen by Dr. Hay and Dr. Knapp, and afterwards by Prof. Horner, of Zurich, all of whom advised against iridectomy; but was subsequently operated upon by a local surgeon in a small town on the continent.

> Here then we have a case of chronic recurrent iritis, extending over two years, and persistent to an unusual degree. We are accidentally enabled to study the effects of an iridectomy on the progress of the disease, which at the time was evidently growing less severe. It must be admitted that there was no immediate effect upon the disease, and that in all probability the ultimate cessation of the symptoms was due to the fact that the malady had worn itself out, and was self, rather than artificially limited. In view of all the circumstances I am unable to persuade myself that the iridectomy did any good here, or would be justified in another similar case.

Dr. Knapp said that iridectomy in chronic iritis had frequently resulted badly, and that his experience had taught him to restrict it to those cases in which there is a tendency to cyclitis and glaucoma.

Dr. CHAS. S. BULL, of New York, reports *Three Cases of Restoration of the Eyelid by Transportation of a Flap without a Pedicle.* In two the deformity was the result of extensive burns, and in the third of caries and long-continued suppuration of the inferior orbital margin and malar bone. A flap, considerably larger than the space to be filled, was taken from the forearm and carefully freed from fat and connective tissue. Only two or three sutures were used, and the whole surface was covered by a single layer of gold beater's skin and five layers of iodiform gauze; a layer of borated cotton was placed over all and held in position by a roller bandage. There was no considerable sloughing, and only moderate subsequent contraction, and the result in each case was satisfactory.

Dr. B. E. FRYER, of Kansas City, also reports *A Successful Case of Skin Flap Transplantation without Pedicle to Lower Lid, after removal of an Epithelioma.* The operative procedure was much the same as in Dr. Bull's cases. Gold beater's skin *plaster* was used and the cotton and bandage were dispensed with. Three months after the operation there had been but slight contraction, and the graft very closely resembled the surrounding surface.

Dr. R. H. DERBY, of New York, in this connection reports a *Case of Gangrene of the Lids, with subsequent Restoration of Tissue without Plastic Operation*, and remarks that: "in Wolfe's operation it has been more than once noticed that while the transported flap has shrunk to very small dimensions, yet an improvement in the condition of the parts has been observed. May the history of the above case possibly throw some light on what takes place in such cases?" Several members spoke of the excessive shrinking that usually takes place on flaps transported by Wolfe's method.

Dr. G. C. HARLAN, of Phila., presents the history of a *Case of Monocular Blindness, with violent Blepharospasm and Mydriasis, all relieved by Mental Impression.* The symptoms, which were very obstinate and had resisted prolonged treatment by a variety of methods, yielded at last to the application of a Charcot magnet. An imitation of the magnet made of wood was subsequently found to be equally efficient.

Two Cases of Neuro-retinitis with almost sudden Loss of Sight in both Eyes, are reported by Dr. KNAPP, of New York. "In one blindness remained permanent, with the exception of a small island in the visual field of the right eye; in the other case, sight was perfectly restored in both eyes. The blindness in both cases was binocular and absolute, with complete immobility of the pupils on changes of light, in the first case for several months, in the second for three days. There is nothing very unusual in the recovery of sight after neuro-retinitis from meningitis and other diseases, much less unusual is the permanence of blindness after neuro-retinitis; but total blindness occurring in the course of several hours, being accompanied by nothing but choked disk, constitutional diseases such as albuminuria, diabetes, syphilis and the like being absent, is certainly very rare." During the discussion, cases were cited of blindness with optic atrophy resulting from cerebral disease, all other symptoms of which entirely disappeared; and reference was made to the fact that extensive disease may exist in the frontal lobes without producing any decided symptoms.

Dr. WM. F. NORRIS, of Philada., contributes a paper on *Hereditary Atrophy of the Optic Nerves.* He gives the history of a family of seven children, in every one of whom the disease appeared. The parents had perfectly healthy eyes, but the great-grandmother, a granduncle, two uncles, and several cousins, all on the mother's side, had been affected. The loss of sight came on gradually in all except one of the seven children. Frequent frontal headaches with loss of central vision were the most prominent symptoms. The fields of vision for form, yellow, blue and red were also contracted, on the order mentioned. "Unfortunately, no remedy has as yet been found which exerts a marked influence on shortening the course of the disease, or in mitigating the severity of its manifestations." In the younger children of the family, the disease commenced at an earlier age. The earliest age was seven and the latest thirty-five.

Dr. JOSEPH A. ANDREWS, of New York, discusses *Jequirity Ophthalmia.* He admits that treatment by jequirity is not altogether free from danger, and urges the importance of selecting appropriate cases, and making the application with care. As it has been found that different patients vary greatly in their susceptibility to the effects of the drug, he commences with a weak solution (2 per cent.) applied only once in twenty-four hours, and regulates the after-treatment according to the result obtained. He applies the solution by brushing it over the palpebral conjunctiva, and advises against instillation and the use of saturated compresses.

Papillary hypertrophy of the conjunctiva is not favorably influenced by the remedy, and pre-existing purulence is a positive contraindication to its use.

He has never been able to find any micro-organisms in the trachomatous tissue.

He considers it important that the jequirity solution should be fresh.

During the discussion, several members called attention to the fact that the conjunctiva loses its sensibility to jequirity after continued applications. Dr. Schell had found that an old solution is just as effective as a fresh one if it has been preserved with boracic acid, according to the suggestion of Mr. Sayre.

A New Perimeter is described by Dr. EZRA DYER, of Newport, R. I. It is "a combination of the bow perimeter of Aubert-Förster and the hemisphere of Sherk." As it is impossible to give a satisfactory description of the instrument without the diagram, the reader must be referred to the original. "The advantages claimed for this perimeter are—first, the entire field of vision is traversed by the eccentric object, from the periphery to the centre, and, by reversing the motion, from centre to periphery, in two minutes without haste. This brings an exhaustive examination of the field of vision for the detection or exclusion of a limitation or scotoma, within the available time of any one. Second, when a limitation of the field is detected it can be very rapidly marked out, saving time to the examiner, fatigue to the patient, and insuring greater accuracy, as in the short time required there is very little danger of a movement of the head. Third, both objectives can be made small electric lights of from one to seven candle power, at will. With these the sensibility of the retina can be tested quantitatively."

Dr. H. S. SCHELL, of Philadelphia, reports a *Case of Embolism of the Retinal Artery.* The patient, a woman 71 years of age, experienced a flashing of different colors before the left eye, followed by sudden loss of vision of that organ. "The ophthalmoscope disclosed a pallid and swollen disk and œdema of the central portion of the retina, with, however, no red spot at the macula. The vessels were altered; the veins very much smaller than the arteries, the latter not much below their normal diameter. There was a very slight difference of color between the two sets of vessels. In the inferior branch of the artery, just before it passed over the edge of the disk, there was a space, about one-fourth of the disk's diameter in length, which was apparently empty of blood. This space included the entire calibre of the vessel, was pale in color, and motionless. Pressure upon the ball from before backward in the manner recommended by Mauthner, so as to increase the ocular tension, emptied the veins completely, but had no effect upon the arteries. The veins refilled instantly when the pressure was removed. After massage had been practised in this way for some minutes, a regular current of blood began to flow through the vessels. This movement was made visible by the fact that the blood stream was broken into numerous very short cylinders, separated by about their own lengths, and following in regular procession, without rhythm, and with about the apparent rapidity of the blood-corpuscles in the capillaries of a frog's foot under the microscope. These little cylinders passed from the disk some distance along the arteries before they were lost sight of in the œdematous retina, then formed again at the distal extremities of the veins, and flowed back to the disk."

Two months afterward "the disk had become white; the arteries thread-like, except that three small spindle-shaped dilatations, on as many branches, could be seen." There was only light perception.

Examination of the heart showed insufficiency of the mitral valve, and hypertrophy of the left ventricle.

Under the head of *A Case Illustrating the Natural History of Cataract*, Dr. A. Mathewson, of Brooklyn, gives the history of a patient, aged 84, who became blind from cataract more than twenty years ago. The right eye was successfully operated on in 1863, but the left was not interfered with. The latter was subject afterwards to repeated attacks of iritis, which subsided without adhesions. In 1881 he noticed that vision began to return in that eye, and a $+\frac{1}{12}$ glass (he had been myopic) gave $\frac{20}{70}$. The opaque lens had disappeared from behind the pupil and was found, much shrunken, attached to the ciliary region below. In 1883 this eye was attacked with acute glaucoma, and it was subsequently found necessary to remove it. The remnant of the lens was found attached at one edge to the ciliary region.

Several similar cases were mentioned by Dr. John Green.

Dr. Wm. F. Norris, of Philadelphia, reports a case of *Myxo-sarcoma of the Orbit*, occurring in a child four months old. The disease was first noticed at two months. Three months after the child was first brought to the hospital, the tumor, which had grown quite rapidly, was removed, with all the contents of the orbit, the periosteum was dissected off, and the orbital cavity was packed with lint soaked in a solution of chloride of zinc. The child made a good recovery, and remained in excellent health for about eight months, when there was a recurrence of the growth under the inner part of the lower lid. The growth was again removed, but returned soon after the patient left the hospital, and proved fatal by ulceration and hemorrhage.

Dr. Norris also reports a case of *Osteoma of the Orbit*, occurring in a delicate woman of thirty-two. It had been growing for nine years, and occupied the entire floor of the orbit. It was removed with a gouge and mallet, coming away without much difficulty, in pieces. The side of the patient's nose and mouth lost their sensibility, from wounding of the infra-orbital nerve, but it returned in a few weeks.

Dr. L. Webster Fox, of Philadelphia, gives the *Clinical History of a Case of Sympathetic Ophthalmia*, which ran an unusually rapid course. The left eye of a boy, 12 years old, was injured in the ciliary region by a sharp-pointed knife. Vision commenced to fail in the right eye in less than three weeks, and when seen by Dr. Fox, not much more than three months after the injury, the patient had only light perception in each eye.

Two Cases of Orbital Abscess are reported by Dr. J. A. Lippincott, of Pittsburgh, Pa., both occurring in children. In each case the pus was evacuated by deep puncture. In one there was complete recovery, with full vision; in the other, a year afterwards, there were some exophthalmos, partial ptosis, swelling of the eyelids, optic atrophy, and vision limited to light perception. In the latter case, the patient was less than a year old at the time of the operation.

Dr. W. W. Seely, of Cincinnati, in some *Experiences in Refractive Cases*, insists upon the importance of paralyzing the accommodation before testing the refraction.

Dr. Chas. J. Kipp, of Newark, N. J., describes two *Cases of Disease of the Frontal Sinus*. In one, a healthy man, fifty-four years of age, had suffered for many years with frontal headache, and for a year had been affected with protrusion of the eye and double vision. "Palpation discovered a nodular tumor of irregular form, which was adherent to the upper half of the inner and nearly the whole of the upper margin of the orbit. It projected about $\frac{3}{8}$ of an inch towards the eye, and extended backward in the orbit as far as the finger could reach. It felt hard and unyielding to the finger. No fluctuation could be discovered." Dr. Kipp supposed that he had to deal with a sarcoma connected with the periosteum of the orbit, but, in attempting to remove it, discovered that it was an abscess, and evacuated a large quantity of fetid pus. The patient was doing well, but on the eleventh day was attacked with pneumonia, of which he died. An autopsy showed that the disease was simple pneumonia, without any evidence of a metastatic character. The frontal sinus, the ethmoidal cells, and the spheroidal sinus had been converted into one large cavity. The walls of the cavity were carious, and numerous large spicula of bone projected from them.

In the other case, a woman 57 years of age, had also suffered for many years, almost constantly, from a severe pain in the frontal region. A tumor, about the size of a hickory-nut, which had been growing for about six months, was immovably attached to the inner upper angle of the orbit. The patient refused to submit to an operation. Some months afterwards she returned to be treated for an inflammation of the eye. Dr. Kipp frequently examined the tumor, and, on one occasion, unexpectedly felt it give way, and succeeded by pressure in evacuating it into the nose. By keeping the cyst evacuated by frequent pressure, and treating a naso-pharyngeal catarrh, the disease was finally cured.

The history of a *Case of Glioma of the Retina* (*Double Congenital*) is given by Dr. Wm. S. Little, of Philadelphia. The patient, a female child, was eight months old when first seen. Sight was entirely gone from the right eye, and but little remained in the left. There was the characteristic white reflex in each eye. No heredity. Attention had not been called to the eyes until the child was five months old.

Tumors subsequently formed in the temples and the neck. Death occurred about two years after the commencement of the disease.

Dr. Theobald mentioned a case in which he had enucleated an eye for glioma, and there had been no return in six years.

Dr. Knapp said there were well-authenticated cases of permanent recovery, though they were extremely rare. In one of his own cases operated upon fourteen years ago, there was still no return of the disease.

Dr. G. C. Harlan, of Philadelphia, reports *Two Cases of Swelling of the Optic Papilla, possibly Congenital*. In one case, the patient applied for correction of myopia, and had no other symptom. There was a swelling of between three and four dioptrics of each disk. Their margins were indistinguishable, and marked striations extended well on to the retina. More than three months afterwards there was no change.

In the other case the patient was hypermetropic, and for some months had been subject to some frontal and occipital headaches, and ocular pain increased by use of eyes. There had also been occasional dizziness and transient diplopia. There was a swelling of each disk of about two dioptrics. The symptoms disappeared after correction of hypermetropia and general treatment, but at the end of more than two months there was no change in the ophthalmoscopic appearances.

Several members referred to similar cases.

Two Cases, in which Rählmann's Hyperbolic Lenses Improved Vision, are reported by Dr. G. HAY, of Boston. Both were cases of conical cornea, in which numerous combinations of spherical and cylindrical lenses had been tried.

Dr. O. F. WADSWORTH, of Boston, in reporting a case of *Myxœdema with Atrophy of the Optic Nerves*, says:—

> "Although symptoms pointing to disturbance of the cerebral nervous system have occurred in some cases, no affection of the eyes, in particular of the optic nerves, has, so far as I am aware, been described. It may, therefore, be of interest to put on record the following case, in which there was atrophy of the optic nerve. It may well be that the optic atrophy was only coincident, and had no direct connection with the myxœdema. Yet primary atrophy, as this evidently was, when it affects both eyes, is of comparatively seldom occurrence as an independent lesion."

A Report of the Examination of the Employés of the Pennsylvania Railroad, as to Color-sense, Acuteness of Vision and Hearing, by Dr. WM. THOMSON, of Philadelphia, shows the entire success of the system proposed by Dr. Thomson, and adopted by the officers of the road, and which is now used in the selection of all men who are to be employed in signal duty. More than twelve thousand employés have been examined, and "about four per cent. of color-blind, and ten per cent. defective in vision have since been removed from the service, or transferred to other duties, where they can do no injury."

Dr. THOMAS R. POOLEY, of New York, in reporting a *Case of Acute Dacryo-adenitis*, considers the acute form of the disease comparatively rare. As it occurred during the course of an acute diphtheritic inflammation of the other eye, he thinks it probable that it may have been caused by septic absorption.

Dr. N. F. MITTENDORF, of New York, describes two cases of *Multiple Colobomata of the Iris or Polycoria Congenitalis.* The subjects of the defect were father and daughter. In the case of the latter, there were five pupils—one near the centre and the others at the extreme periphery. In the father's case there was a central pupil, nearly normal, and a large one situated peripherally below and divided into two parts by a thin band of tissue.

Dr. JOSEPH AUB, of Cincinnati, reports a successful experience in the *Removal of Foreign Bodies from the Vitreous by aid of the Electro-Magnet.* Several members were inclined to suspect that, on the whole, more harm than good may have resulted from the use of magnets in this way, and that in a large proportion of cases it is better to remove the injured eye. Dr. KNAPP felt sure that by proceeding in this way the greatest good would be done to the greatest number.

Dr. S. D. RISLEY, of Philadelphia, gives the history of *A Case of Hypermetropic Refraction, passing while under observation into Myopia—Symptoms simulating General Nervous Disease.* A nervous girl, twelve years of age, suffering with headache, etc., was found to have, under atropia, $+\frac{1}{60} \frown + \frac{1}{60}^{\mathrm{cyl}}$ ax. 90°. Six years afterwards there was, also under atropia, $-.25 \frown -.50^{\mathrm{cyl}}$ ax. 180°.

Dr. Risley considers that a low grade of choroiditis resulting in disturbances of the nutrition of the sclerotica and gradual distension of this membrane was the cause of the change in refraction. G. C. H.

ART XVIII.—*On Diseases of the Rectum and Anus, including a portion of the Jacksonian Prize Essay on Cancer.* By HARRISON CRIPPS, F.R.C.S., Assistant Surgeon St. Bartholomew's Hospital, etc. 8vo., pp. vi., 429, with plates, etc. Philadelphia: P. Blakiston, Son & Co., 1884.

WHEN a reviewer can say that he has read a book of this size through, from beginning to end, he has already paid it no small compliment; and when he can add that it has nowhere disappointed the expectations which induced him to do this, there remains little for him to do in way of commendation besides laying, if he will, before others some of the excellencies which have attracted and rewarded his attention, so as to furnish them with some reason for such unusual praise, and to give them an idea just what sort of entertainment is offered by the author. To such an agreeable task this book of Mr. Cripps invites us. As his preface informs us, it is a development of his studies in connection with the subject of cancer of the rectum, for which, in 1875, he gained the Jacksonian prize, and to which he has added the results of ten years of special study, with a material such as is furnished by St. Bartholomew's Hospital, where the enormous number of 150,000 patients come under observation every year.

The first chapter is, naturally, upon the anatomy and physiology of the parts concerned. It is all excellent, but we would call attention especially to the author's views in regard to the relations of the hemorrhoidal branches of the inferior mesenteric veins—which, contrary to the teachings of most of the works on anatomy, he thinks to have but slight inosculations with the internal iliacs—and to his description of the relations of the levator-ani muscle, which is illustrated by two plates, and which likewise differs from that which is laid down in most of the text-books. Mr. Cripps's estimate of the analogies between the villi of other parts of the bowel and the follicles of the colon and rectum is not only interesting, but convincing—although not novel; but, while it is doubtless true that absorption is one of the functions of the rectum, we cannot agree with him that it is its "principal office."

In speaking of the physiology of the follicular epithelium, the author gives what may be called the key-note of his views as to the pathology of morbid growths in this region, namely, that the nuclei of the epithelial cells are set free and figure as lymphoid cells, with the capability of developing into epithelium similar to that which gave them birth. This view is well supported by reference to the microscopical appearance of some of the morbid growths which Mr. Cripps has studied—which are figured, from his own admirable drawings, in his book—and is not unreasonable from the standpoint of physiology. What he claims from the evidence he adduces is certainly worthy of the further attention which he asks for it.

In the chapter on malformations of the rectum and anus these are well described, with the indications for operation, as well as the way in which this should be carried out. Several things appear clear from the evidence offered in this chapter, namely, that these deformities should be operated upon; that operation offers a very good chance of success; and that it is best, as has been shown by Dr. Thorn, of Toledo, in an article (referred to) in the *Toledo Med. Journal*, vol. iv. p. 449, not to stitch the end of the bowel to the skin when the operation by dissection is resorted to. Simple punctures are shown to be the most dangerous procedures for the relief of imperforate anus. The author's preference for Littré's operation over that of Amussat we think well founded, as we do his opinion that diligent attempts to establish a channel in the normal position should be made before either of these is had recourse to. In regard to resecting the coccyx, it appears to us that as much might be gained by simply bending it forcibly back, without cutting it off. In this way the new parts would more closely resemble what is normal, and it might be that the function of defecation would be better performed. We doubt whether the tendency to contraction would be increased by saving the rudimentary tip of the spinal-column, and it might prevent the tendency to incontinence.

The chapter on hemorrhoids divides these into internal and external. Of the former there is a practical division into thrombotic, œdematous, and cutaneous, although, as the author says, the two latter divisions are, in a strict sense, not hemorrhoidal at all. For internal piles Mr. Cripps prefers the treatment by ligation, although he mentions other methods, and gives them due credit. He is not afraid to operate on inflamed piles, and justly characterizes the assertion that bleeding piles are a safety valve of nature which it is dangerous to stop up, as nonsense and as unsupported by any scientific evidence. As to the prospect offered by operation, we are glad to see the emphasis with which Mr. Cripps states that a rapid and permanent cure can be promised. The risk to life from an operation on internal hemorrhoids is almost *nil*, but occasionally, as the author has found in his own experience, a life is lost. "The smallness of the risk," as he says, "should not lull the surgeon into a sense of absolute security, and he should spare no effort in ascertaining the general constitutional condition of his patient before subjecting him to operation. . . . . The amount of the risk, slight as it is, should be clearly laid before the patient or his friends. If a man is to have some grave operation performed, such as the removal of a cancer or the amputation of a limb, both he and his friends are well aware of the risk involved, and are accordingly prepared. It is therefore in the smaller operations, regarded by the surgeon and public as free from danger, that a fatality, when it does occur, becomes so tragic from being unexpected."

The recommendation, in case of secondary hemorrhage after an operation on the rectum, that the part should be plugged with cotton covered with powdered subsulphate of iron might be improved, we think, by substituting pledgets of cotton wrung out of a strong solution of alum. In most cases this will serve every purpose, and it has none of the disadvantages of the iron preparation, which, in case the alum did not work satisfactorily, could be used afterwards. But we think it would be a strange case which would not yield to the pressure of a good plug in the rectum, even without a styptic.

The chapter on prolapse of the rectum we will not dwell on, except to call attention, first, to a curious case in which, the patient being a syphilitic infant 18 months old, almost the whole of the colon was invaginated and gangrenous, and came away, and yet the child recovered from the loss; and, second, to the author's preference for the actual cautery rather than nitric acid in the treatment of prolapse.

The chapter on rectal abscess—which we think would be better called "peri-rectal abscess," except that rare variety in which the abscess is really in the substance of the wall of the rectum—is not as thorough as some of the others, although it says probably all that is necessary on this part of the subject.

Fistula in ano is more fully treated of. Here we look with some curiosity to see what is Mr. Cripps's opinion in regard to operating on fistula when the patient has phthisis. With an impression that what he says about the nonsense of fearing to stop up such a vent as is furnished by bleeding piles is likewise applicable to this case, we are not disappointed to find that he has found great advantage to result from the operation in phthisical cases. At the same time, he thinks it injudicious to operate on a fistula in case the lung disease is advanced and the cough troublesome. In this connection, Mr. Cripps calls attention to the prejudicial influence of the prolonged inhalation of the vapor of ether upon a weak lung, and advises the employment of chloroform for anæsthesia, in operating upon the phthisical. Other severe organic diseases are also considered by Mr. Cripps as contraindications to a cutting operation.

In the chapter on anal ulcer or fissure, the danger of mistaking the cause of the pain, and attributing it to vaginismus is adverted to, and the author adds—what we cannot at all understand—that "many cases of coxalgia owe their origin to a similar cause." As to treatment, Mr. Cripps recommends an incision through about a third of the fibres of the sphincter ani muscle, and considers simple stretching as uncertain in its results.

The chapter on ulceration of the anus and rectum includes the ulceration which accompanies syphilitic, tubercular, and Bright's disease. In speaking of the latter a rare case is mentioned, in which a patient died of continuous hemorrhage from ulceration which had stripped the mucous membrane from the colon over a distance of nearly two feet. For the treatment of these ulcers the author suggests the application of the same principles of rest and removal of intravenous pressure which are found to be useful in the treatment of ulcers on the surface of the body. For this purpose rest in bed is recommended, and with it soothing lavements of the ulcerated surfaces. In this connection we remark that the author does not appear to be familiar with the method of irrigating the colon which has been for years in use in certain parts of Germany, and which is so easy to carry out, as well as so efficient a method of washing out or applying soothing fluids to the entire colon.

In the chapter on fibrous stricture of the rectum, Mr. Cripps points out the relative infrequency with which syphilis is the cause of stricture. Of 70 cases in St. Bartholomew's Hospital, recently admitted, only 13 could be attributed to syphilis. When we reflect upon the detestable use of the *post hoc propter hoc* argument which is sometimes made by men who ought to know better, we are glad to see this contravention to the false, but usual, statement that syphilis is the commonest cause of stricture of the rectum. But it will be sad for those who are in the habit of escaping the consciousness of ignorance by appealing to syphilis and charging-up to it whatever cannot be more easily accounted for. If there be a medical habit more pernicious than this, or one more flagrantly supported by authority, we are not aware of it: it is, therefore, satisfactory to find Mr. Cripps opposing it so far as his present subject warrants.

In connection with the question of the diagnosis of strictures and the use of a bougie for this purpose, Mr. Cripps refers to the obstruction usually met with at a few inches from the anus. This, if not due to a stricture, can easily be obliterated by distending the rectum with an injection, when the true nature of the obstruction will be disclosed. He speaks also of a case in which death followed perforation of the bowel with a long enema tube. Such accidents have happened on this side the ocean also; but they need not happen anywhere, if the method, recommended by Monti, of Vienna, be followed, and the distension effected by hydrostatic pressure, obtained with a "fountain syringe" or similar appliance. The writer of this review has not only seen this done many times by Monti, but has himself done it again and again, passing a tube up to the bend of the transverse colon in the youngest infants without any harm ensuing. Mr. Cripps's opinion of the impracticability of examining the rectum by introducing the whole hand, founded upon experiments made on the cadaver, might be changed if he made similar experiments on the living subject. Certain it is that the whole hand, if of moderate size, can be insinuated into most rectums without damaging them, if ordinary care be used. But it is questionable whether this method would be applicable to cases in which there was a stricture present. Here there would probably be difficulty, and perhaps no little danger.

For the treatment of fibrous strictures, Mr. Cripps prefers, where it is applicable, gradual dilatation. Where this fails he thinks well of linear proctotomy, under conditions which we have not space to dwell upon. Colotomy he regards as a *dernier ressort*, and says, "With due care in diagnosis, and by careful perseverance in treatment when discovered, it will be very exceptional for stricture to arrive at such a stage that colotomy affords the only chance of successful treatment . . . ."

The next two chapters treat of pruritus ani, and the impaction of feces and foreign bodies in the rectum.

After this we come to what may be regarded as the *pièce de résistance* of the book, that is to say, the chapters on morbid growths. The first to be considered is polypus, which Mr. Cripps divides into the fibrous, which are covered with a normal mucous membrane, and the adenoid, which consist of an hypertrophy of the mucous membrane itself. Dermoid and cystic polypi are hurriedly treated of, and then villous tumors of the rectum, after which the author takes up the consideration of cancer of the rectum in a long chapter which consists of the Jacksonian Prize Essay, of 1876, revised in 1884. This will have to be read to be appreciated, but we would call attention to a few points contained in it. And first, the author dismisses, after stating his reasons, the idea of the heredity of cancer of the rectum; and we agree with him. Again, he gives an interesting argument in support of his theory that the germs of the new growth consist of the nuclei of its epithelial cells, which, being set free, may develop in the neighborhood of their parents or at a remote point, as in the cases in which secondary deposits, containing cartilaginous nodules like those of the original growth, are found in the liver, and—what more remarkably indicate their origin—when the secondary growth in the liver attempts to develop into adenoid tissue, having all the characteristics of the follicles of Lieberkühn. For Mr. Cripps, this exaggeration of development of the adenoid, or follicular, structure of the mucous membrane accounts for all the morbid growths of this region, if the uncertain form of cancer called colloid be excluded. Malignancy, or the opposite, depends upon the rapidity of development of any growth. The structure also, as seen under the microscope, indicates a difference between these two classes. In the more benign, if we understand Mr. Cripps, there is a mere numerical and symmetrical increase of the follicles, so that the enlarged mucous coat of the bowel is pushed out into its lumen; while in the malignant form the tissue grows rapidly and unsymmetrically, so as to produce a crowded, and distorted mass of irregular crypts and follicles, disposed along the surface and penetrating into the depth of the wall of the intestine. The very fibrous tissue in these growths, Mr. Cripps derives from the collapse of the walls of epithelial cells. The existence of a true basement membrane he denies. Stellate cells are nothing but the adjacent and adherent walls of a number of neighboring epithelial cells. In fine, the sum of Mr. Cripps's explanation of the pathology of these morbid growths is that they increase by the gradual conversion of lymphoid cells on their border into adenoid tissue, and that the source from which these lymphoid cells are derived is the epithelium of the growing tumor.

As to the treatment of cancer of the rectum, Mr. Cripps advises the performance of colotomy only when great pain is plainly caused by irritation of an ulcerated surface, or when the signs of stricture or obstruction are unmistakable. Excision of the rectum for cancer is an operation which Mr. Cripps thinks well of, if the cases be suitable. It is not to be applied to all cases indiscriminately. The cases to which it is suited are those in which the morbid growth is within four inches of the anus, and, in women, has not extended on the anterior wall further than three inches; the rectum must be fairly movable on the neighboring parts, and there must be no sign of hepatic infection. The results of the operation in the cases coming under the author's observation and collected by him certainly warrant his warm indorsement of the good opinion of the operation held by a number of the best surgeons of his own country whom he names, as well as by Kelsey and Roberts, who have made the matter the subject of special study, in this country.

So much by way of analysis of this book. In criticism there is little to say. We have detected a few, a very few, slips in it, such as "bacteriæ" for *bacteria* (p. 312), "the history of the cases show" for *shows* (p. 240), and one or two lesser lapses. We do not like the English use of the term "disease" to indicate a morbid growth. Yet, as a whole, we find this book a model, not only of intrinsic worth but also of literary style. We notice with especial pleasure the rare charm of a correct use of the subjunctive.

It may be added, in conclusion, that the mechanical execution of Mr. Cripps's book is worthy of its other merits. The paper, printing, and binding are excellent, and the plates which accompany it are very fine indeed.

C. W. D.

ART. XIX.—*Medico-Chirurgical Transactions.* Published by the Royal Medical and Chirurgical Society of London. Second Series. Volume the Forty-ninth. 8vo. pp. lxxxiv., 287. Longmans, Green, and Co., 1884.

THE surgical papers of this volume are neither numerous nor of great intrinsic value, and we may therefore be excused for prefacing what we have to say about them by a few remarks upon the first paper in the book, *The Address of the Retiring President*, Mr. JOHN MARSHALL. It speaks of those whose connection with the Medico-Chirurgical Society has been severed by death during its last official year, and while it therefore lacks that value which belongs to scientific work, it yet appeals to the natural instincts of all who in becoming physicians do not cease to be men. Most of those of whom Mr. Marshall speaks were men who attained but little eminence in their profession, and the brief records of those contained in this address convey to its readers all that is known of the struggles, and, results of lives, which while of infinite importance to their possessors, were of but little moment to the world. Were this the proper place for such reflections we might dwell upon the lessons which may be gleaned from these little-known lives, lives such as must belong to most of those who read these pages, but we pass them by merely noticing that one ended as a consequence of the risk and self-sacrifice belonging to our profession, from blood-poisoning contracted during an operation for tracheotomy; that one was largely devoted to entomology, and that a third was misdirected into the special path of therapeutics known as hydropathy. Among the men of eminence of whom brief memoirs are included in Mr. Marshall's address, appear the names of our own Sims; of Charles Hilton Fagge, whose contributions to medical literature were both numerous and valuable, and out of proportion to a short and frail life; of Robert Druitt, to whom so many of us owe our first acquaintance with surgical science; and of William Farr, whose fame as a collector of vital statistics is without rival. Mr. Marshall concludes his graceful and interesting address with some observations upon the progress and present condition of medical societies in London and some other British centres, which, while of most importance to those living in Great Britain, are not without suggestive value to the profession elsewhere.

The first surgical paper is by JONATHAN HUTCHINSON, F.R.S., *On High Amputation for Senile Gangrene.* In it the position is taken that if an amputation is done far removed from the seat of the gangrene, as in the lower third of the thigh when the foot is involved, a favorable result may be looked for, and one which will add very much to the comfort of the patient. The reason for this Mr. Hutchinson thinks is to be found in the fact that in many cases the obstruction to the circulation on which the gangrene depends is progressive and does not extend high up, and that there is therefore good ground to expect the establishment of the collateral circulation upon which the integrity of the flaps and the successful issue of the amputation depend. For these reasons Mr. Hutchinson thinks the plan of high amputations in these cases, first proposed by Mr. James, of Exeter, is worthy of more favorable consideration than it has heretofore received from surgeons. His personal experience with the proceeding has been limited to six cases, but he has known of some cases in which it has been adopted by others, and it has proved most satisfactory. By the use of Esmarch's bandage Mr. Hutchinson thinks there is little risk from hemorrhage, while under the use of Listerian precautions he has learned to look upon amputation as a less serious measure *per se* than he once regarded it. The paper is a suggestive one, and the proposal coming from a man of Mr. Hutchinson's experience and eminence should lead to a review of a subject upon which hitherto the verdict of surgeons has been unfavorable.

The Direct Treatment of Psoas Abscess with Caries of the Spine is the theme of the next surgical paper. It is contributed by Mr. FREDERICK TREVES, F.R.C.S., one of the assistant surgeons to the London Hospital, who boldly proposes to treat such cases, when the disease is located in either of the lumbar, or in the twelfth dorsal vertebra, by incision and free drainage. Nor is this somewhat novel proposal hastily or thoughtlessly made. Mr. Treves argues that in very many instances the unfavorable results attending upon caries of the vertebræ are directly traceable to the difficulty the discharge has in getting to the surface, the extensive destruction of parts involved in its reaching the surface, and the enormous abscess cavities which remain. He thinks that were the parts less deeply situated at least as good results would be obtained as are secured in caries of other, but superficial bones, containing much cancellous tissue. Acting upon this belief he has devised an operation by which the bodies of either of the lumbar vertebræ, or that of the twelfth dorsal one can be safely reached. In three instances he has practised the operation with very satisfactory results. He makes a vertical incision two and a half inches long directly over the outer edge of the erector spinæ; dividing the aponeurosis of this muscle its fibres are drawn aside by retractors and the anterior but deeper sheath is divided, thus exposing the quadratus lumborum. Taking a transverse process as a guide, this thin muscle is cautiously incised to the whole length of the superficial wound, great care being taken not to injure any of the lumbar vessels. Some of the tendinous fibres of the psoas muscle lying next are then divided close to a transverse process and the finger insinuated alongside of it until the anterior aspect of the bodies of the vertebræ is reached. Mr. Treves is convinced that with ordinary care there is no danger of opening up the subperitoneal connective tissue, or of wounding the peritoneum, and thinks that the danger of cutting the lumbar arteries, or their abdominal branches, can be avoided by keeping close to a transverse process. In actual practice the operation is less difficult than would appear from the description, as the patients are generally thin, their muscles atrophied, and the deformity existing tends to facilitate the attempt to reach the diseased part, while, when the psoas is reached, the abscess generally found provides an easy way of access to the diseased vertebral body. Mr. Treves narrates the history of three cases in which he has resorted to this operation. In two of them he was able to remove sequestra and drain the abscesses, while in the third, the operation was found to be unnecessary, active disease in the spine having ceased, the symptoms to relieve which it was undertaken being dependent upon another cause. Every surgeon will recognize the formidable character of the operation proposed by Mr. Treves, and will therefore hesitate before following in his steps; but on the other hand in view of the otherwise hopeless condition of these cases, and the very unsatisfactory results attained by expectant treatment, his suggestion is worthy of careful consideration.

Mr. WALTER WHITEHEAD, of the Manchester Royal Infirmary, next narrates a case in which he secured the *Radical Cure of a Large Spina Bifida in an Adult.* The tumor was situated over the sacrum of a woman 27 years old, and measured twenty-three inches in circumference, twelve inches in a transverse direction and ten inches vertically. Tapping the tumor, and its collapse, was followed by alarming symptoms—which, however, yielded to a seton inserted in the back of the neck. After it had refilled an attempt was made to drain the tumor gradually under antiseptic precautions, but the constitutional symptoms were again both distressing and alarming. The actual cautery was applied as a counter-irritant to the collapsed tumor, and the plastic inflammation thereby set up led to a closing of the small aperture by which communication was maintained with the spinal canal, suppuration in the sac and cure of the tumor following. Mr. Whitehead concludes that the tumor contained sub-arachnoid fluid and possibly some posterior nerves, but none of the spinal cord, that the favorable result was attributable to the inflammatory action set up by the hot iron, and that the result affords encouragement to try the same means in other cases where the contents are no more vital than in this one.

Three Forms of Spinal Deformity is the theme of the only remaining surgical paper in the volume. It is contributed by W. ARBUTHNOT LANE, M.S., F.R.C.S., connected with Guy's Hospital as demonstrator, and assistant surgeon to that for Sick Children. Three forms of deformity produced by the occupation of the individuals are described, and pictures of the specimens are given. The deformities described are those produced by habitually, and for years, carrying heavy burdens upon one shoulder, directly between the shoulder and upon the head. Each method is found to have its peculiar deformity, resulting from protective curves, osteoplastic growths, and alterations in the intervertebral cartilages, and, in some cases, complete fusion of the bones. The paper is suggestive and well worked up, but it hardly admits of condensation, nor can the reviewer do it justice without the aid of its accompanying cuts.

S. A.

In the Marshall Hall Prize Oration on *Cerebral Localization, a Review and a Forecast*, Dr. FERRIER clearly shows what benefits the labors of the past ten years have conferred, particularly in lighting the path of the clinicist through darkness, almost chaotic; but the address will be chiefly remembered for the advocacy of a bolder and more general cerebral surgery. The appeal to the surgeons has not been in vain, but wider experience can alone decide whether the cranial cavity in man can be opened with the same "unfailing safety" with which physiologists expose the brain in monkeys.

The question of the action of digitalis upon the arteries does not appear to be finally settled, and Drs. RINGER and SAINSBURY, in a paper entitled "*Investigations into the action of the Digitalis Group*," bring evidence to show that the members of this group, digitaline, strophantus, dyak, scillitine, etc., act primarily on the muscular coat of the arteries and not indirectly through the nervous system. They hold that in part at least the rise in blood pressure, which Schmiedeberg attributes solely to the action of the heart, must be induced by narrowing of the calibre of the bloodvessels.

Dr. FRANCIS CHAMPNEYS deals with several interesting points in the *Artificial Respiration of new-born children.* An *addendum* to a previous communication calls attention to the frequency of emphysema of the anterior mediastinum in fatal cases of tracheotomy. In 28 cases at the Hospital for Sick Children it occurred in 16, and in two there was also pneumothorax. In most of these cases artificial respiration had been performed. From experiments on still-born children he concludes (1) that the presence of air in the abdominal viscera in no way impedes the ventilation of the lung by artificial respiration. (2) That bending the head back and pressure on the cricoid cartilage are powerless to prevent the passage of air into the stomach during mouth to mouth inflation; and, (3) that hanging the head backwards over the edge of a table does not provide for the patency of the upper air-passages. He urges the introduction of a catheter to a distance of 3½ inches from the lips, through which gentle insufflation can be made.

Dr. BROADBENT describes a form of *Alcoholic Spinal Paralysis*, giving one case in full and referring to six others. The chief features are increasing weakness of the lower extremities and subsequently loss of power in the extensors of the forearm giving rise to wrist-drop. As the paralysis advances all the muscles of the extremities are affected, then those of the trunk. Eventually the respiratory muscles are involved, the diaphragm first and then those of the chest. Sensation is not affected, and the power of the sphincters remains unimpaired. A striking feature is the loss of tone in the capillaries as indicated by the swollen, pale, or livid state of the limbs. The disease is not thought to be due to myelitis but is believed to be allied to acute ascending paralysis, but the differences between the two affections are sufficiently marked to warrant a distinction by name, and as in all the cases there was excessive indulgence in alcohol Dr. Broadbent has no hesitation in assigning this as the cause of the disease.

Mr. BLAND SUTTON illustrates the *value of systematic examination of still-born children* by a record of several cases of great interest among them of fatal endocarditis, stricture of the duodenum and congenital lateral curvature of the spine.

Dr. RADCLIFFE CROCKER narrates three cases of *xeroderma pigmentosum*, the first which have been described in Great Britain. The disease is an atrophy of the skin, due probably to a neurosis, and is accompanied by pigmentation, and later by verrucose projections and fungating tumors. It is remarkable in selecting only one sex in a family. Crocker's cases occurred in three brothers, the children of a healthy farmer. He suggests as a more suitable name *atrophoderma pigmentosum.*

An intersting sequel to the history of Harriet Brown, one of Dr. Ord's cases of *myxœdema*, is recorded by Dr. JOHN HARLEY, who gives a report of the post-mortem appearances and an analysis of the tissues for mucin. Although this constituent was increased, the most marked feature was the excess of connective tissue everywhere met with, so much so that Dr. Harley speaks of it as a "general fibrous invasion." The thyroid gland was quite atrophic. The thoracic cords of the sympathetic were implicated in fibrous pleural adhesions, and the author is inclined to connect this with the pathology of the disease.

Dr. HERMAN has a brief paper on *an average or "composite" temperature chart of smallpox* based upon thirty-one cases of the unmodified disease. The figures indicating the temperatures in the different cases for the same day of the disease and period of the day were added together and then the total was divided by the number of observations.

Dr. CAYLEY and Mr. PEARCE GOULD report a case of *gangrene of the lung* treated by free drainage, with recovery.

Dr. CECIL BISS also reports a case of paracentesis and free drainage of *basic cavity*, which proved fatal by abscess of the brain.

Dr. BROADBENT'S contributions to cerebral pathology are numerous and important, particularly in all relating to disturbances of speech. In this volume he describes *a particular form of amnesia, loss of nouns*, of which three cases are given, and discusses at length the pathology of speech affections.

Dr. SHARKEY reports a case of *absorption of a large portion of the right hemisphere* from embolism of the right middle cerebral artery, death not occurring until seven years after. Hemiplegia and hemi-anæsthesia at first occurred, but the latter disappeared. The angular gyrus and superior temporal convolution were destroyed, and yet sight and hearing were not abolished on the opposite side; sight was at first, the left eye was amblyopic. This agrees with the results of experiments on animals.

Dr. MATTHEWS DUNCAN calls attention to the frequency of *albuminuria in parametritis*, for which he is unable to suggest any suitable explanation. In none of the perimetritic cases was it present.

Dr. STEPHEN MACKENZIE records a series of observations on the *weight of the thyroid body* in persons dying of various diseases. This has considerable value just now when the connection between affection of this gland and myœdema cretinism seems so probable. W. O.

ART. XX.—*A Handbook of Pathological Anatomy and Histology, with an Introductory Section on Post-mortem Examinations and the Methods of Preserving and Examining Diseased Tissues.* By FRANCIS DELAFIELD, M.D., etc., and T. MITCHELL PRUDDEN, M.D., etc., 1885. 8vo. pp. 575. New York: William Wood & Company.

THE volume now under consideration is issued as the second edition of Delafield's "Handbook of Post-mortem Examinations and of Morbid Anatomy," which was published in 1872. The change of title is so complete, however, as to suggest that practically a new book has been prepared; one which treats in particular of pathological anatomy and only incidentally of the method of making post-mortem examinations. At the same time it directly aims at being received as a manual of diagnosis.

A comparison of the scheme of the two books shows that in the second edition there is added as wholly new matter an account of inflammations and of degenerations, with a description of the methods necessary for the examination of diseased tissues and bacteria.

It is to be regretted that the authors have not seen fit to so modify the section on the method of making post-mortem examinations as to get rid of some of the objections apparent thirteen years ago, and still equally evident. The directions for opening the cranium give no indication of the means to be employed for properly securing the calvaria when the incision is to be closed. Neither is the possibility guarded against of a disfiguring depression across the frontal region, three and a half inches above the root of the nose of bald-headed individuals, or of others with preternaturally high foreheads. Few physicians, however practised they may be in the cutting of human flesh, possess such skill as to make an incision through the abdominal wall, dividing everything down to the peritoneum, without cutting through this membrane and into the subjacent intestine. Again, it may be a refinement in method, but the possibility is not mentioned of removing larynx, pharynx, and trachea subcutaneously, without extending the primary incision for opening the thorax and abdomen to an inch below the chin. A suitable revision of this section should have resulted in some mention of Meynert's method of opening the brain, and an allusion to the easiest means of removing the petrous bone and exposing the tympanic cavity.

The obscurity concerning the seat of the cephalhæmatoma, the confounding of congestion and injection, the omission of all reference to the medicolegal importance of the uric acid infarction of new-born children are as apparent in the second edition as they were in its predecessor.

The second part of the volume, which is largely made up of new material, contains much to be praised with but little to be criticized. The concise descriptions of the various morbid processes not only give a very fair statement of the prevailing opinions concerning the subjects considered, but their style is exceedingly attractive, a matter of no little importance to the general reader. The least satisfactory of the sections in this part of the volume is that treating of inflammation, which is perhaps too original to become generally useful. It may be added that it is a questionable convenience which is furnished by the separate consideration of inflammation in connective tissue, mucous membranes, and in the viscera as the starting point for the general treatment of the subject. The cellular inflammation of the authors is not, as one might infer, a variety, producing cells in general, but is manifested by a growth and multiplication of connective-tissue cells, especially of endothelium. Its further description suggests that this variety of inflammation corresponds with that which most writers regard as the first stage of an acute inflammation of serous membranes.

The authors must have had frequent opportunities of seeing an inflamed mucous membrane covered with a non-adherent layer of clotted fibrin, and another whose superficies was in a necrotic condition. To identify these lesions and to designate them as a croupous inflammation suggests the standpoint of a generation ago when croup of the bowels and dysentery of the uterus were regarded as well-defined lesions.

The section on tumors deserves special commendation as a practical paper, being short, well-balanced, free from prejudice, and admirable in style.

Part III. relates to the morbid anatomy of the various organs, and is of unequal merit, as the contents of the first edition appear to have been rewritten or revised. The sections upon the nervous system, the liver and spleen are those which at once attract attention for their merit, and deserve to be mentioned with special favor.

The book as a whole might have been somewhat diminished in bulk, and perhaps have been improved in quality had the more important sections of Part IV. been incorporated in the preceding portions of the volume. Even had this plan been regarded as inexpedient the blemish of so many blank spaces from the partial use of pages should have been overcome.

The "Handbook of Pathological Anatomy and Histology" represents a decided improvement upon the "Post-mortem Examinations and Morbid

Anatomy," and the second edition of the latter deserves to be called by another title. There is much new matter to be found, most of which is written in a manner to suggest an appreciation on the part of the writer of the present position of the subject of pathological anatomy. The admirable drawings illustrating the histological changes in various pathological processes form an important addition, and the table of contents and the index are a great convenience to those who may desire to consult this work. R. H. F.

ART. XXI.—*Guy's Hospital Reports.* Edited by FREDERICK TAYLOR, M.D., and N. DAVIES-COLLEY, M.A., M.C. Vol. XLII. London: J. & A. Churchill, 1884.

GUY'S has suffered severely by the premature death of several of the most brilliant members of the staff. Not many years since Phillips was cut off as he was entering upon a splendid career; Fagge has gone and now Mahomed has followed them. This volume opens with an appreciative notice of the life and work of HILTON FAGGE, who was the type of a good hospital physician, equally at home in the out-door room, the bedside, or the post-mortem theatre, and always as ready to learn as he was willing and able to teach. It is gratifying to know that the volumes on medicine which were in preparation at the time of his death will be edited by one of his colleagues, and the profession will not be deprived of the fruits of his long and varied experience.

The volume contains many papers on medical topics covering a wide range of subjects.

Sir WILLIAM GULL contributes two interesting cases; the first a *Case of probable Thrombosis of the Superior Mesenteric Vein and Renal Veins with detachment of Valvulæ Conniventes of the Jejunum. Recovery.* A young man, æt. 23, the subject of secondary syphilis, was seized on Oct. 12th with severe abdominal pain and profuse intestinal hemorrhage. There was no fever. Three days after the attack the patient became collapsed, abdomen tympanitic, and there was vomiting of bilious matter. On the 20th and 21st sloughs of valvulæ conniventes were passed and continued to appear in the evacuations until the 27th. The urine contained albumen and blood. From the 27th the intestinal symptoms disappeared and the patient gradually made a good recovery, although the urine three years after the attack continues albuminous. A good plate is given illustrating the appearance of the sloughs. Supposing the lesion to have been thrombosis of the mesenteric veins (or, what we think perhaps more probable of the arteries due to a local syphilitic arteritis), it is remarkable that the necrosis should have been confined to the mucous membrane.

The other case is one of *Typhoid Fever fatal on the seventy-sixth day with Hemorrhage due to recent Typhous Ulceration in the Ileum*, and is recorded in support of the view that the "typhous process once begun has to run a course longer or shorter until the body becomes insusceptible to its influence." The process of *elimination*, as generally held, has nothing to do with the recovery, but the symptoms subside when the process of *assimilation* is complete. In typhoid fever this process is not always completed in one attack but may be repeated "constituting a double or triple or even a quadruple typhoid." The case reported died during a fourth repetition of the symptoms, and a plate is given illustrating the recent ulcers in the ileum with others of older date.

An interesting paper by Dr. HALE WHITE deals with the *Theory of a Heat Centre from a Clinical Point of View.* This theory supposes that there are calorific centres for opposite sides of the body situated somewhere in the middle region of the cortex, near the fissure of Rolando, which perpetually exercise a restraining influence on the temperature of the body by inhibiting the thermogenetic changes in the tissues. From these centres, which are probably closely related to those of the muscles, fibres pass to the thermic tissues, traversing in their course the region of the basic ganglia, the crura, pons, and, after decussation, passing to the tissues with the spinal nerves. The cases are first considered in which with disease of the brain there was a rise in temperature, and, after a careful analysis, the general conclusion is reached that the elevation can in all be explained by the destruction or interruption of the calorific fibres passing from the heat centres to the thermogenetic tissues. The cases with lowered temperature are then discussed and are held to be capable of explanation either by shock, by wide-spread vaso-motor palsy, or by irritation of the calorific inhibitory fibres. And lastly there is a careful *résumé* of the physiological evidence for the existence of heat centres, based largely upon Wood's researches, and an attempt is made to show how closely this tallies with the clinical conclusions.

Dr. MAHOMED'S paper on *Albuminuria and the Symptoms which indicate its Gravity* is a most valuable contribution to renal pathology, and will be read with a melancholy interest as the last of so many interesting communications in these reports upon this his favorite subject. The paper is divided into three parts: the first deals with the experimental evidence regarding albuminuria, and the conclusion is reached "that physiologists at present are able to afford us very little reliable assistance in pathological inquiries of this nature, as they have no means of producing "delay" or "acceleration" on the capillary circulation throughout the body." The arterial pressure can be regulated but in pathological variations of arterial pressure, the capillary circulation is the important factor, and we know as yet very little about the conditions retarding or accelerating its flow. It is suggested that the key to the control lies in the varying rapidity of the production and discharge of carbonic acid and the absorption of oxygen. Evidence of reduction in the specific gravity of the serum, which Hamilton and others connect with the increase of the arterial pressure, is not thought to be conclusive.

The second part deals with the clinical and anatomical aspects of albuminuria as associated with venous congestion, errors of diet, neurotic conditions, disturbed cutaneous function tissue, alterations in the kidneys, and increased arterial pressure. Upon the importance of the last factor Dr. Mahomed again insists, maintaining that the increase on arterial pressure precedes the appearance of albumen in the urine, and is the earliest symptom of Bright's disease. The section on the recognition of albuminuria deals with the various proteids which may occur in the urine and on the best means to be employed for their detection. Attention is called to the important fact, often overlooked, that the albumens may not only change their characters after the urine has stood for some time, but may undergo such alterations as interfere with the usual reactions. The old tests of heat and nitric acid are deemed insufficient, as they fail to give reactions with many albumens while the new tests give good negative results, but are liable to cause errors of commission as they may produce precipitates which are not albuminous. The advantages and fallacies of the various tests are fully considered.

In the concluding part on the clinical significance of albuminuria we are reminded of the fact that we may have this condition temporarily with practically healthy kidneys, though it indicates in every instance undue stress upon the renal circulation, except perhaps in those cases in which peptones appear as a result of imperfect digestion. Various groups of albuminuria are then considered under the following headings: (1) Cases of fully developed Bright's disease with albuminuria, etc. (2) Cases in which the cardio-vascular symptoms and changes of Bright's disease exist with little or no albuminuria. (3) Cases of nephritis in which the albuminuria is severe, prolonged, and accompanied by dropsy, but in which there is no increase of arterial pressure. (4) Cases of slight albuminuria in which the arterial pressure is increased. (5) Cases in which there is slight or intermitting albuminuria but no other symptoms of Bright's disease; the arterial pressure not being increased. Illustrative cases are given under each of these groups. It is suggested that the urine of the forenoon should always be examined in doubtful cases, and finally the use of the sphygmograph is strongly urged as essential to the correct appreciation of variations in arterial pressure so important in early Bright's disease.

In an article on *The Relationship between the Structural Changes and the Clinical Symptoms of Chronic Renal Disease associated with Dropsy*, Dr. GOODHART discusses particularly those cases of Bright's disease, which we usually term acute, as they come on with anasarca, but which are essentially subacute or chronic from the outset. The insidious onset, chronic course, and intractable nature of these cases are especially dwelt upon. The condition met with post mortem is either the contracted white kidney or the large red granular one, whereas the large white kidney is the final stage of those cases of actually acute nephritis which drag on and become chronic. The existence of a special form of *glomerulo-nephritis* is doubted, and the writer holds that there is no evidence of the large white ever passing into the granular kidney.

Dr. GOODHART also has a *Note of Two Cases of General Anasarca in Children without Albuminuria.* They were believed to be of nephritic origin.

Dr. SAVAGE, the Director of Bethlem Asylum, has an interesting paper on *Hypochondriasis and Hypochondriacal Insanity*, in which the relations of these affections are considered and many illustrated cases recorded.

There are two valuable contributions on *Hypertrophic Cirrhosis.* Dr. PRICE records a case with very diffuse fibroid change resembling the syphilitic cirrhosis of infants. He has analyzed the records of 142 cases occurring at Guy's since 1875, and among the conclusions at which he arrives are several of great interest, such as the occurrence of shrinkage in a primarily enlarged organ; the fact that the cirrhotic liver is as a rule larger and heavier than normal, and the more rapid course of the disease in cirrhosis with enlargement.

Dr. CARRINGTON reports a case of hypertrophic cirrhosis which simulated very closely suppurative hepatitis. The patient, a woman, aged 42, was admitted (after an illness of four months) with fever, emaciation, sweats, shiverings, and an enlarged, tender liver. The temperature sometimes reached 104°. An analysis of fifty cases in which observations were made showed that in eighteen there was fever of an irregular type.

Dr. PITT records a case of *Extensive Cerebral Softening with Descending Sclerosis in the Lateral Column* in a child two years old. No cause to account for the softening could be found.

Dr. FREDERICK TAYLOR reports seven cases of *Aortic Aneurism opening into the Pulmonary Artery.* The clinical features are not distinctive, nor are there any characteristic physical signs.

Dr. GOODHART gives a list of the *Specimens added to the Museum* during the years 1882–83, and 1883–84, which shows the care with which typical and illustrative preparations are preserved to enrich the splendid collection—one of the chief glories of the Guy's school. W. O.

The first surgical paper of this volume, entitled by its author, Mr. PICK, *Surgical Reminiscences*, consists of several isolated cases of great interest, and a series of luxations of the humerus where only imperfect reduction was at first attainable, although ultimately success was achieved. The first case—one of rupture of the urinary bladder, followed only by mild peritonitis and recovery—presents many points of interest. For instance, a pyriform tumor was readily mapped out occupying the normal site of a distended bladder, which really was due to an extravasation of blood in the abdominal walls caused by the blow which ruptured the bladder. Another absolutely unique point is, that owing to complete loss of the expulsive power of the bladder, an elastic catheter was constantly worn, being uninterruptedly retained for from five to six weeks at a time, and yet when withdrawn the instrument was as smooth and polished as when first introduced. The urine remained clear, nor was there either pain or inconvenience from the long sojourn of the instrument within the bladder. This tolerance persisted four years, and only gave out after a hemiplegic attack followed by a general breakdown of health and strength. One important lesson it seems to us is taught by this most instructive case, namely, that even with an intra-peritoneal extravasation of urine, we need not despair of success in certain rare instances without resort to operative interference, by such simple treatment as the constant retention of a soft catheter through which injections of warm water, or, better still, antiseptic solutions, are occasionally to be thrown. Next follows an account of a successful ligation of the right common iliac artery for aneurism of the external vessel of the same name, notwithstanding the serious complication of suppuration of the sac. An abstract of its history cannot profitably be made, and the reader is referred to the original.

Mr. Pick then proceeds to relate a number of instances where in comparatively recent luxations of the head of the humerus, complete reduction was impossible, owing, the author thinks, to the rent in the capsule being so small as just to allow the escape of the humeral head which there remains tightly girt by unyielding fibrous tissue. Now, when reduction is attempted, a layer of capsule intervenes between the socket and the head of the humerus, which must be removed in some way—for instance, absorption by pressure—before complete reduction can be effected. To achieve this result Mr. Pick reduced the displacement as far as possible, and then retained the head of the bone in its improved position for many weeks by means of axillary pads, air-cushions, etc., with appropriate bandages to retain the arm in firm contact with the body. The author gives the details of several cases where this method was pursued, with results more satisfactory than could have been anticipated; certainly an infinitely better joint being secured than by an abandonment of all attempts at improvement when a complete reduction fails, as is too commonly done.

The next two papers are by Mr. R. CLEMENT LUCAS, in the first of which he reports a case of *Fracture of the Skull, in which Cerebro-spinal Fluid escaped from the vault fourteen days after trephining.* The author refers to two cases published by him in former volumes of these Hospital Reports, in which tumors filled with cerebro-spinal fluid formed beneath the scalp as the result of simple fracture of the vault. From a study of these two cases he draws the following conclusions: (1) "That cases of simple fracture of the skull followed by collections of cerebro-spinal fluid beneath the scalp are peculiar to children;" and (2) "That when cerebro-spinal fluid escapes through the vault (whether the fracture be simple or compound) the injury has extended to the ventricular cavity." The case which forms the subject of the present memoir would doubtless have also presented a tumor beneath the scalp filled with cerebro-spinal fluid had not the urgent compression symptoms compelled Mr. Lucas to trephine. Erysipelas followed by meningitis and death, gave an opportunity to discover the source of the cerebro-spinal fluid which had commenced to escape by the wound on the fourteenth day after the operation. The post-mortem examination proved—as well depicted by the lithographic plates of the injured brain and skull—that the external wound communicated with the left lateral ventricle, thus proving the correctness of the second conclusion enunciated by the author in his first paper. The positive proof afforded by this post-mortem, where nothing had previously suggested any more serious lesion than a wound of the visceral layer of the arachnoid, satisfactorily disposes of—even in default of other similar facts—the hypothesis that such an injury can give rise to the escape of cerebro-spinal fluid from the vertex. Were this view true, the author goes on to say, "the appearance of cerebro-spinal fluid ought to be much more frequent than it is in cases of compound fracture of the skull. For it is certain that in many instances in which the dura mater and brain are known to have been torn, no escape of clear fluid has occurred. On the other hand, in every case in which an autopsy has taken place, the communication between the wound and the ventricular cavity has been demonstrated." Recovery, where cerebro-spinal fluid has formed a tumor beneath the scalp, the author contends is no valid argument against the truth of his views, as the most extensive lacerations of the brain and its membranes are recoverable from in children without symptoms of grave import, provided meningitis does not occur. Such ready recoveries are explainable, so Mr. Lucas thinks, by the non-development of the intellectual faculties in children.

An instructive case of *Gangrene of the Skin and Cellular Tissue of the Arm following Vaccination*, forms Mr. Lucas's second contribution. The judicious use of the word "following" is the key to the whole case, which although presenting a questionable history of inherited syphilis, is yet satisfactorily shown to have been due to the low general state of the child's health, the result of artificial diet, neglect of cleanliness, etc. We wish that the same judicious fairness of observation was brought to bear upon all cases of the supposed evil effects of vaccination.

Mr. ARBUTHNOT LANE discusses in a long and interesting paper the subject of *Cervical and Bicipital Ribs in Man*, the basis of which is supplied by a number of specimens carefully described and figured by the author. Additional drawings of museum specimens illustrate the paper, which, together with a brief description of those referred to in Professor Turner's paper on supernumerary cervical ribs and quotations from Gruber, Halbertsma, and Luschka, form a most instructive contribution. Space forbids more than one or two references, but the anatomist and, in a minor degree, the surgeon will be well repaid by a careful study of Mr. Lane's work. Want of symmetry and an imperfect development of the lower part of the thorax while its upper portions are overgrown, is of common occurrence where anomalous ribs are present. An important arterial anomaly is of not infrequent occurrence when these supernumerary ribs are present, viz., an unusually high position of the subclavian artery in the neck, owing to the vessel passing over the cervical rib when it is of any length.

Seven cases, *Illustrating the Various Results of partial Subcutaneous Laceration of Arteries*, serve as a basis for an elaborate paper by Mr. CHARTERIS J. SYMONDS. "By partial laceration is understood an injury in which the internal tunics alone are ruptured, the external, as in ligation, remaining intact." In three of his cases Mr. Symonds reports the return of pulsation in the vessel below the site of the injury in three, five, and seven days; whence, he argues, the artery at the point of injury and occlusion has again become pervious. He considers this the only explanation, as too short a time had elapsed for the establishment of collateral circulation, in support of which position he quotes a case of ligation of the axillary, where "the pulse was not counted till five weeks after operation." He then describes a specimen in Guy's Hospital Museum where a femoral artery contains a clot with a central lumen produced either by tunnelling or by absorption. Still further, Mr. Symonds contends that "the large vessels of the limbs may contain plenty of blood without pulsation existing. The presence of blood I have been able to demonstrate by the production of a wave in the radial, obtained" in two cases "by compressing the brachial and suddenly removing the pressure." This is a most interesting observation, and bears out the author in his suggestion, that in "the so-called temporary occlusions there may all the time be a gentle stream traversing the vessel, insufficient to produce a pulse, but capable of being recognized by the above method." A practical point well illustrated by these cases is strongly insisted upon, viz., that gangrene, at least in the upper extremity, is dependent not only upon injury of the vessel, but also "largely upon the amount of injury sustained by the surrounding parts." In Mr. Holmes's words: "If the injury be uncomplicated it probably will not lead to gangrene," except, perhaps, in the case of elderly people with atheromatous vessels. Finally Mr. Symonds cases, as well as a number of others collated by him, show that they can be arranged according to results under the three following heads:—

1. Those in which complete occlusion occurred.
2. Those in which temporary occlusion occurred.
3. Those in which a consecutive aneurism occurred.

The next contribution, *A Case of Gastrostomy in which the artificial opening was subsequently closed*, is one well worthy of being borne in mind, since, as the author, Mr. N. DAVIES-COLLEY, truly says, no case has "as yet been fully recorded in which the operation has been followed by such an amelioration in the condition of the stricture as to allow of the subsequent closure of the artificial opening." From the analogues presented by strictures of the urethra and rectum, such a result might be anticipated but has not before been more than approximately realized. There is but little doubt that the stricture was due to syphilis, but anti-syphilitic treatment could not be borne, as shown by repeated trials. By permission of Mr. Bryant the further progress of a case operated upon by him and previously reported, is given by Mr. Davies-Colley, where the improvement was almost as great as in the author's patient, although no attempt to close the gastric fistula was made. We strongly advise our readers to study the details of these most instructive cases.

Notwithstanding all that has been written upon the subject of *Colles's fracture*, it would appear from Mr. LUCAS's paper on that subject, that there is still much to be learned as to the facts concerning this well understood injury, as it is commonly considered. Mr. Lucas discusses the subject under eight heads, the first being "Explanation of the pain on the inner side of the wrist and hand," which is shown by a plate of a dissection to be due, not to damage or stretching of the internal lateral ligament, the usual explanation, but to the displacement and stretching of the dorsal branch of the ulnar nerve by the projecting head of the ulna. "How the position of the annular ligaments determines the effect of muscular action in maintaining or reproducing the deformity" is the second caption, and under it most important points are discussed and statements made. The author points out, that sections of united fractures will give an appearance of impaction which is really due to encasement of the upper fragment by the callus, and that while not denying that such impaction does occur, he thinks that it is much less frequent than is usually taught. Granting that such impaction does occur in some few cases, Mr. Lucas maintains that "muscular action is alone sufficient to maintain and reproduce the deformity." After discussing the views of various authors as to which muscles produce the deformity, he makes the original observation that—

> "the loss of balance between the muscles on the anterior and posterior surfaces of the wrist which follows fracture of the lower end of the radius, and enables the latter muscles to draw back the separated extremity, depends on the relative position of the anterior and posterior annular ligaments. The posterior annular ligament crossing the ends of the radius and ulna binds down all the extensor tendons, save two, to the dorsal surface of the radius. Consequently, when the radius is fractured immediately above the ligament, not only the supinator, longus, and extensors of the thumb, but in addition the extensor carpi radialis longior, extensor carpi radialis brevior, extensor communis digitorum, and extensor indicis will all tend to drag back the fragment, and give a backward direction to the articular surface. Owing to the anterior annular ligament being on a lower level running across the bones of the carpus and being unattached to the radius, the flexor tendons have no direct influence upon the fragment, and the extensor tendons are consequently left unopposed."

In proof of this, a case seen during life by Mr. J. Hutchinson, and dissected after death by Mr. Couper, is described, where before death there was none of the deformity so characteristic of Colles's fracture, *complete paralysis* existing the result of coincident head injury. After death, *when rigor mortis had set in*, the "silver-fork" deformity was well marked, and could not be reduced by violent force; but when all the muscles had been divided except the thumb extensors and that of the little finger, the fragments were readily coaptated by gentle pressure. The third proposition, which is ably discussed and we think proved, is that "fracture of the styloid process of the ulna and rupture of the triangular fibro-cartilage are frequent complications." In the experience of Mr. Lucas, the fibro-cartilage is torn, not at its apex as one would expect, but it is separated at its base, *i. e.*, is rent from its radial attachment. The freedom of movement regained (Caption IV.) is shown by dissection to be due to abnormal mobility acquired by the medio-carpal joint.

Under the fifth heading, "Explanation of the absence of crepitus," Mr. Lucas shows that the extensor tendons tend to hold the upper edge of the lower fragment upon the posterior edge of the upper, so that nothing more than a hinge movement can usually be imparted to them, which of course is not the to-and-fro one requisite to elicit crepitus. We shall pass by Captions V. and VI., merely remarking that under the latter is discussed the history of a case of that rare accident, a displacement of the lower fragment *forwards* the result of a fall upon the palm. As this injury was a compound one, and accompanied by a forward compound dislocation of the ulna, the peculiar position of the lower radial fragment is readily explained. The concluding section consists of a careful description of Colles's fracture, which we have not space to notice in detail, although we must dissent from the author's statement that the deformity will as a rule recur if once properly reduced. Proper reduction is difficult, and in many cases no extension that we can exert will reduce the displacement. Over-extension of the hand with direct downward pressure on the lower fragment by relaxing the untorn periosteum, will effect what no amount of extension aided even by direct pressure will do. There is great room for fallacy as to the perfection of the reduction effected by extension, etc., as proved by the results when the swelling disappears. The manœuvre which we have suggested, followed by over-flexion of the hand while the surgeon's thumb supports the lower end of the upper fragment, will oftentimes so mould and adapt the fragments as to prevent any further tendency to displacement. We make this statement advisedly, feeling convinced that incomplete reduction and not an innate tendency to displacement, accounts in many cases for the subsequent deformity of a Colles fracture.

The last paper that we shall notice is one by Mr. DAVIES-COLLEY, on *Hernia of the Appendix Vermiformis*. After relating the history of four cases operated upon by him or his colleagues, and quoting in abstract several others, he concludes with the following propositions, which are given verbatim, except that certain sentences are omitted, which would be meaningless by reason of the reader's being unable to refer to the full text:—

1. "The appendix vermiformis may form the sole contents of an inguinal or femoral hernia of the right side." (A foot-note shows that this portion of the intestine may even occupy an inguinal rupture of the *left* side.)

2. "When strangulated alone in the sac it may give rise to all the symptoms of acute strangulation of the intestine," as in two of the cases reported; or, "on the other hand, as in case one, and that of the gentleman operated on by Dieffenbach, the symptoms of constipation may be absent."

3. "If this strangulation is left unrelieved, acute inflammation, with suppuration, sloughing, and perforation, may follow, and this inflammation," as in one reported case, "may cause acute peritonitis;" or, as in another, "the patient may recover after operation with a fecal fistula."

4. "The appendix may be incarcerated in an old hernia, and may become adherent to the walls of the sac. Here it may remain for many years without producing any serious symptom. It may then, as in Mr. De Morgan's case, become the site of ulceration from the lodgment of foreign bodies, and so set up

suppuration in the hernial sac;" or, as in one case in this paper, "it may be injured by taxis or a truss, or by the presence of portions of the bowel or omentum which have descended into the sac. Severe inflammation and great swelling may thus be set up in the process and the parts adjacent. Lastly, as in the singular case under Prof. Billroth, some cystiform change may take place in the incarcerated appendix, and, by its great tension, set up all the symptoms of acute strangulation."

In conclusion, Mr. Davies-Colley calls attention to the importance of early operation in small herniæ of the right side, when the other symptoms of strangulation are present despite the absence of constipation, for here we may have to deal only with an incarcerated appendix. When of long duration, and even with a quite adherent thickened appendix, the adhesions may be divided and the protrusion returned within the abdomen, as was successfully done in one case. When, however, the appendix is much inflamed and suppurating, the author, for reasons too numerous for rehearsal, is inclined to advise that it be ligatured and removed, as has been twice done, but only once did recovery take place.

From the necessarily brief notices that we have been compelled to give of the papers in this volume of the Hospital Reports it will be seen that many of them are of very unusual interest, and that all are worth a careful perusal, so that the present work does not fall below the high standard of its predecessors. C. B. N.

ART. XXII.—*A Theoretical and Practical Treatise on the Hemorrhoidal Disease, giving its History, Nature, Causes, Pathology, Diagnosis, and Treatment.* By WILLIAM BODENHAMER, A.M., M.D. Illustrated. Large 8vo. pp. xvi. 297. New York: William Wood & Co., 1884.

THE author of this book has been so long a student of the diseases and defects of the lower end of the bowel that one naturally expects that anything which he has to say about these subjects will be of more than ordinary value. In this expectation the book before us furnishes no disappointment. It shows the effect of careful and learned research into the literature of hemorrhoids, and is concluded by a bibliographical list which indicates the richness of the mine from which the author has drawn his material. Nor is it in collating the results of the experience of others alone that the author has earned a claim to a hearing; for he has also had a very large experience of his own, by which to test the value of the conclusions of other workers in the same field. These two sources of information have enabled him to make a book which has interests beyond those which are measured by their mere practical utility, and which will make it useful to any one who wishes not only to know what is now known upon its subject, but also to learn what was known long ago, and what, nevertheless, often passes as new at the present day.

The first chapter is devoted to the historical aspect of the subject, and in it the disease is traced, by a not altogether conclusive argument, to the ancient Egyptians and Hebrews. But all through the book there are quotations and references which throw even stronger light on the question of the antiquity of this disorder, and which, combined with a fair reasoning from analogy, make it clear that hemorrhoids can hardly have been long after the appearance of the human race in making their own appearance. The chapter on the "Etymology and Application of the word Hemorrhoids" is about as distinctly historical as that called so, and the next, on "Description and Definition" is but little less so. The rest of the book follows pretty closely the ordinary arrangement of books on the same subject. Etiology, symptomatology—though this is made into several chapters, and is not called by this name—diagnosis, prognosis, and treatment are considered consecutively; all in the light of the most ancient as well as the most modern records.

In connection with the author's discussion of the causation of hemorrhoids we note that he lays considerable stress on the influence of heredity, and cites some interesting cases in which whole families, or a large part of them, were similarly affected. There is, of course, no reason why a tendency to piles should not be inherited, as well as that to any other defect or disorder, but it is possible, in all apparently such cases, that bad example, and bad training in regard to food, habits of defecation, and so on, may have had a good deal to do with the result. It is interesting to observe that the author emphasizes the fact that it is an error to attribute too much to the full habit in the causation of hemorrhoids: a fact which ordinary experience confirms. It is also interesting to find that the author is not carried away with the mechanical explanation of the causation of hemorrhoids. He states it fairly, but adds very sensibly, "The explanation of these causes is probably too mechanical to be entirely and strictly correct. It tends too much to limit the resources of nature within the bounds of our own deficient comprehension. If the explanation is strictly true, then it would seem that nature had made us very defective in the organization of those parts. . . . . Nature never constructed these parts for the purpose of producing hemorrhoids," etc.

We cannot agree so fully with the author's opinion that the use of purgatives is a "frightful source" of hemorrhoids in this country. No doubt there are those who have piles because they are always irritating their rectums with drastic purgatives; but we think the opposite error of permitting one's self to become habitually constipated is much more common and much more to be feared and deprecated. And, so far from sharing the author's view that the use of purgatives is too general nowadays, we are inclined to think that the present generation somewhat underestimates the extent of their usefulness.

We disagree again with the author in regard to the influence on the bowels of the ingestion of matters which cannot be digested; such as the seeds of various berries. Of course no one would doubt that there is such a thing as carrying the ingestion of indigestible substances to an immoderate and injurious extent. But no more, we think, can any careful observer doubt that the ingestion of a certain proportion of indigestible material with the food is of the greatest service in keeping the bowels in good order. In fact, having made this particular matter the subject of some study, we are convinced that a judicious use of the very articles the author fears is to be urged upon the community, as a means of freeing them from one of the commonest causes of hemorrhoids. In this the author may be right and we wrong; but, with due regard to his authority, we have a positive conviction that he is mistaken.

In speaking about the method of cleansing the anus after defecation, the author recommends the finest and softest material, citing the disgust-ing—though intended to be amusing and luxurious—suggestion of Rabelais, that a swan's neck be employed. A good plan, not mentioned by the author, is for a person to make his first, rough cleansing with soft paper, then to sit over the edge of a bath-tub, and wash the anus off with cold water by means of sponge reserved for the purpose; and finally to dry the parts with a towel, by simple pressure, without rubbing. This practice, if carried out at every stool, will tend to prevent the formation of hemorrhoidal tumors, and to keep them from giving trouble when they have formed.

The author tell us, in his chapter on Etiology, that "The profound emotions—terror, fear, rage, sorrow, ennui, restlessness, or nostalgia—may be a direct cause of hemorrhoids." As to this, we find it as hard to believe that the most profound emotion could really *cause* hemorrhoids, as to believe that ennui and restlessness can be considered to be profound emotions. This is one of the places where we think the author has been a little carried off his feet by the movement of his story. We do not wonder; but we think he will not object to learning how it strikes one who has not the, so to speak, parental interest in its development which he has.

The part of this book devoted to the symptomatology of hemorrhoids is admirable, although a little irregular in its arrangement. The discussion of the diagnosis and prognosis is also very good. In regard to the merit of what the author says about the treatment of hemorrhoids, opinions will differ as the readers of the book are partisans of the ligature, cutting, crushing, cauterization, or injection. The author is so convinced of the superiority of the ligature that we think he fails to do full justice to the claims of all the other methods; and, although most surgeons in this country share his preference for ligation, there is a good deal to be said in favor of some of the other methods in use in Europe.

So much in detail. When we come to look back upon this book, as a whole, we cannot refrain from expressing our admiration for the labor and pains the author has bestowed upon it. For its construction Hebrew, Greek, and Latin works have been laid under contribution to such an extent as to display the author's erudition, and sometimes to puzzle the printers and proof-readers. Here and there we find mistakes in spelling, which might be corrected, and in some of the Greek words we find the accents wrong.

But this is a minor matter. As a whole the book is admirable, and will add to the already good reputation of the author, as well as furnish a rich source of otherwise unattainable information to any subsequent investigator of the subject.

The publisher's part of the work is very well done. The paper, printing, and binding are excellent, and the cuts are, with one or two exceptions, very good, The two chromolithographs are more suggestive than illustrative. But they are as good as one generally sees.

C. W. D.

ART. XXIII.—*Transactions of the American Qtological Society. Seventeenth Annual Meeting.* 8vo. pp. 325. New Bedford, Mass., 1884.

AN extended discussion of mastoid operations is commenced by Dr. H. KNAPP, of New York, with a paper *On the Indications for Opening the Mastoid Process, based on some Recent Observations.*

He says, that formerly he "was disinclined to operate when there were no external symptoms of suppuration in the mastoid region, and when in acute otitis media there was free discharge of healthy pus through the external meatus," but that more extended experience has not only changed his opinion upon these two points, but has inclined him to consider the operation indicated in certain cases in which no suppuration is suspected, either in the tympanic cavity or mastoid cells, *i. e.*, cases of sclerosis of the mastoid. He illustrates the benefit of the operation in these different conditions by reporting cases in which it was performed. In one there was acute tympano-mastoiditis with free discharge from the tympanum, but violent and persistent pain, extending over the side of the head, and not relieved by the usual remedies. The outer layers of the mastoid bone were healthy, but an opening, one centimetre deep, evacuated a large amount of pus and a rapid cure followed.

The second was a chronic case of purulent otitis media without external signs of mastoid disease, but with severe and continued hemicrania. The bone was found to be hyperæmic and undergoing a process of sclerosis, and it was necessary to penetrate nearly two centimetres before a cavity was reached. Only a few drops of sero-mucous fluid escaped. The headache was at once relieved.

The third case was one of sclerosing mastoiditis, without discharge and with an intact membrana tympani. There was intense headache over the corresponding side accompanied by dizziness. The mastoid was red and slightly swollen, and there was swelling of the posterior wall of the meatus. Anodynes, leeches, and various applications gave no relief. The periosteum of the mastoid was found normal, but the bone was condensed and very vascular. There was no secretion. There was immediate relief from all symptoms.

Dr. Knapp prefers a small chisel to any other instrument for performing the operation.

Dr. J. A. LIPPINCOTT, of Pittsburgh, Pa., reports *A Case of Mastoiditis Interna Chronica with Sclerosis; Trephining; Recovery.*

There was violent pain, referred partly to the region of the middle ear and partly to the mastoid, and occasionally extending over the side of the head. Except slight swelling and some tenderness of the mastoid, there was no external evidence of disease, but the pain not only continued but grew worse, in spite of prolonged and careful treatment. As a final resort, the mastoid was punctured to a depth of seventeen millimetres with Buck's drill. No suppuration was found, but complete relief followed.

In the discussion, Dr. Sexton, of New York, disapproved of perforating the mastoid except to give exit to pus in the cells, and did not believe that opening these parts in so-called "eburnation" could be of service in middle ear disease or brain affections. As the mastoid antrum lies on a higher plane than the tympanum, and the upper portion of the tympanum is frequently cut off from the lower portion by swelling of the intervening structures, he considered that the best way to drain the antrum is by an incision into the posterior part of the membrana flaccida. He thought that pus in the mastoid cells might often be, with advantage, evacuated by an opening in the posterior wall of the meatus.

Dr. Buck and Dr. Knapp disapproved entirely of the incision through the wall of the meatus, as it causes a high degree of inflammatory swelling, which closes the meatus and makes free evacuation impossible.

The value of swelling of the optic disks as an indication for the operation, and other points of interest in connection with this important subject were freely discussed by several members of the society.

Dr. ALBERT H. BUCK, of New York, reports his experience in the use of *Large Doses of Potassium or Sodium Iodide in Sudden Deafness of Supposed Syphilitic Origin.*

This treatment was tried in five cases without result. The author is inclined to think that such cures as those reported by Drs. Roosa and Webster will always be exceptional. Several other members had had similar experience.

A case of *Disease of the Ethmoid, the Consequence of Chronic Catarrh of the Nasopharynx; Exophthalmus,* is reported by Dr. J. J. B. VERMYNE, of New Bedford, Mass.

There was a "tumor the size of half a hazelnut, extending from the upper inner edge of the orbit to a little below the ligamentum canthi internum, gradually sloping backward as far as the finger could reach. It was of bony hardness, slightly uneven, not painful to the touch, immovable, and connected with the os planum or the lamina papyracea of the ethmoid bone." He thinks it was either an exostosis or a retention tumor, and discusses the diagnosis and treatment of tumors originating in the ethmoid and encroaching upon the orbital cavity.

In a paper on *Reflex Aural Phenomena from Nasopharyngeal Catarrh; Objective Noises in and from the Ear,* Dr. C. H. BURNETT, of Philadelphia, reports three cases in which there were objective noises in the ear, which he attributed to the irritation of naso-pharyngeal disease. "The irritation in the nares and naso-pharynx in these cases may be reflected to the muscular tissues of the velum palati, the fibres of the superior constrictor of the pharynx, and to the pterygoid muscles, producing clonic spasms, which in turn produce snapping sounds, audible at greater or less distance from the patient."

A case of *Myxo-fibroma at the Basis Cranii causing Blindness, and seven years later Deafness by Destruction of the Labyrinth,* is reported by Dr. J. J. B. VERMYNE, of New Bedford, Mass. When first seen the patient complained only of occasional dimness of vision, and the ophthalmoscope showed congestion of the optic disks. Intense headaches commenced several months subsequently, and death did not occur for more than eight years. A tumor 6 cm. long, 4 cm. broad, and 2 cm. thick, was found in the anterior portion of the left inferior occipital fossa, beneath the tentorium and adherent to the dura mater covering the petrous portion of the left temporal bone. The posterior surface and top of the pyramid were largely eroded.

Dr. CHAS. J. KIPP, of Newark, N. J., reports a case of *Epithelioma of the Auricle,* and one of *Cavernous Fibrolipoma of the Auricle.* The former occurred in a healthy boy, æt. 19, and its "rapid development would seem to make it at least improbable that the tumor was really what the microscopical examination showed it to be—an epithelioma." The growth was "largely made up of epithelial cylinders, between which were numerous large, round, oval, and spindle-shaped cells, imbedded in a fine fibrillar tissue." The subsequent history of the patient could not be ascertained, and the author doubts whether the growth was really a malignant one.

Dr. LUCIEN HOWE, of Buffalo, N. Y., in reporting a case of *Hæmatoma Auris in a Sane Person treated with Injections of Ergot*, calls attention to the rarity of the disease in females, and to the fact that it is usually associated with some form of insanity. There was no history of injury in this case, though both ears were affected—one four years after the other. Very decided improvement followed the repeated injection of ergot.

Dr. Sexton said he had recently had the opportunity of examining a number of othæmatomata occurring in the sane. He found that among pugilists this affection of the ear is almost universal. Dr. Wadsworth called attention to the fact that the Greek statues of pugilists had the ears deformed as they would have been from hæmatoma.

Dr. W. M. SULZ, of Cincinnati, in a communication on the use of *Jequirity in the Treatment of Suppurative Otitis Media*, states that he had used it in a number of cases of chronic suppuration with a view of bringing about a thinning of the thickened mucous membrane with a fair proportion of good results.

Dr. H. N. SPENCER, of St. Louis, Mo., in *A Contribution to the Mechanics of Naso-pharyngeal Practice*, describes a modified powder-blower and spray apparatus.

Dr. CHAS. A. TODD, of St. Louis, Mo., reports a case of *Necrosis of the Right Labyrinth; Total Facial Paralysis in the same side; Partial Recovery.* The disease dated from the time of an attack of the measles, fifteen years ago. A sequestrum finally removed consisted of a part of the cochlea.

Prof. T. D. CLARKE, of the New York Institute for Deaf Mutes, in behalf of the Convention of Teachers of Deaf Mutes by the new method, requested information of the society in the following points:—

1st. A test for hearing of such a nature that the results by different observers can be compared.

2d. Any means of determining the difference between hearing and feeling in persons who may have never heard.

3d. Any method or course of exercises that could be used in our institutions to develop, improve, or train defective hearing.

4th. Any precautions that should be taken to prevent injury to diseased ears by shouting or making loud noises near them.

The matter was referred to a committee.

Dr. SAMUEL SEXTON, of New York, exhibited a specimen of *Sarcoma of the Concha*, which he considers rare; also some illustrations of malformations of the auricle resulting from imperfect closure of the bronchial cleft. He also discusses the *Influence of Dental Irritation on Diseases of the Ear*, illustrating the subject by wood-cuts representing conditions of the teeth that have given rise to such irritation. G. C. H.

ART. XXIV.—*A Practical Treatise on Massage, its History, Mode of Application, and Effects, etc.* By DOUGLAS GRAHAM, M.D., Fellow of the Massachusetts Medical Society. 8vo. pp. viii. 286. New York: William Wood & Co., 1884.

DR. GRAHAM's hand-book, the professed object of which, as he himself states in the preface, is to resuscitate the "numerous articles and abstracts on the subject of Massage which are scattered throughout medical literature and are practically buried alive in it," is entirely satisfactory from this point of view. The author has shown great patience and research in extracting the cream of the various treatises upon the art of massage, and his own ripe experience has enabled him to make judicious selection from the material which he has collected. The treatise is exhaustive, comprising, as it does, the history of massage, the method of its application, and its physiological effects, as well as special attention to its application in neurasthenia and to the internal organs, in diseases of the central nervous system, in writers' cramp, in neuralgia, muscular rheumatism, sprains and joint affections, etc. These titles show the wide scope of the work, and each subject has plenty of space allotted to it, and the literature bearing upon that point is thoroughly canvassed.

What is said of the use of massage in writers' cramp, or what is commonly called the method of Wolff in the treatment of this troublesome neurosis, derives additional interest from the fact that in a recent number of the *British Medical Journal*, Dr. De Watteville reports the absolute recovery in a very short space of time of several cases of writers' cramp which had defied all other methods of treatment, and which he sent to Herr Wolff. Were it not for the slow but certain accumulation of evidence from other sources one would almost be inclined to regard Vigouroux's statistics of Wolff's cures as incredible, it being stated that over fifty-four per cent. of the cases submitted to Herr Wolff recovered, and some of the most stubborn of these required only a fortnight of treatment. The chapter upon the treatment of neurasthenia by massage is also to be noted as especially valuable.

Whilst Dr. Graham's book is very comprehensive and complete, we can hardly regard it as a standard text-book upon the subject, for where the author should be judicial he is argumentative, and after reading a chapter (and especially Chapter V.) the impression is inevitably left that the author is defending himself and his art against possible adverse criticism. The text is marred by occasional improprieties of diction, and the press-work by too frequent errors. But if we bar these, the work may be regarded as a most valuable addition to our current medical literature.

R. P. R.

ART. XXV.—*Transactions of the Obstetrical Society of London*, Vol. XXVI., for the year 1884. 8vo. pp. 375. London: Longmans, Green & Co., 1885.

THE average attendance of Fellows at the ten meetings of the year was fifty-seven, and the number of contributors to the volume is thirty-four.

Of the latter, twenty have become well known to us by reason of their active fellowship during a series of years. Having nearly seven hundred ordinary Fellows, it will be seen that the Obstetrical Society of London is no exception to what we notice of our own medical bodies, that the real work is done by a very few, the balance being content to listen to the reading of the papers, or what is much more common, to read them themselves after publication. All honor is due to the names of Drs. Aveling, Bantock, Robert Barnes, J. Matthews Duncan, Galabin, Greenhalgh, Hewitt, J. Braxton Hicks, Oldham, Playfair, Priestley, Meadows, and Thornton, and to Mr. Lawson Tait and Sir T. Spencer Wells for the number and value of their contributions to obstetrical science. A marked feature in the Transactions has always been the value of the remarks made in discussing the merits and the subjects of the respective papers read, and as these are often of more practical worth than the monographs themselves, we are careful in our review to give them due notice. This comparison is no disparagement to the papers, which are often avowedly presented for the purpose of obtaining a conference and interchange of views upon the subject matter from those who are known to have been close observers, and to have had a large experience. It is greatly to the credit of the busy obstetricians and gynæcologists of London that they are the most regular in their attendance at the meetings, and are the largest contributors to the annual volume. We commend this fact to many in our own cities who claim that they have not time to attend society meetings, and give to younger members and the cause of science the benefit of their experience.

The first paper we shall note is that by Mr. Edward Sabine Tait, on *Puerperal Temperatures.* This paper was based upon a series of observations made in the General Lying-in Hospital upon 125 women, 60 primiparæ and 65 multiparæ, recorded every four hours during the post-partum month. In these 125, the highest temperature occurred on the third day, in 41; on the fourth day, in 28; and in the second day, in 20 = 89. In the balance (36) the highest points attained were scattered over the balance of the first week (11), and through the second week (25). Of these last 25, there were 13 primiparæ and 12 multiparæ, and in 11 the cause was believed to be undoubtedly nervous, such as fright, temper, excitement at seeing friends, etc.

Laceration of the perineum was observed to determine the point of time for the highest temperature in cases where there was a considerable tear: thus in 32.2 per cent. the highest temperature was on the third day; in 26 per cent. on the second; and in 22.6 per cent. on the fourth. In 6 forceps cases (primiparæ), the highest was on the third day in 3; and on the first, second, and fourth, in 1 each. In 3 forceps cases (multiparæ), the highest point was reached on the first day, in 1, and second, in 2. The introduction of the hand in the third stage did not appear to have any effect upon the time of the temperature maximum.

In Perineal Rupture Cases the following was noted: Of the 60 primiparæ, only 5 entirely escaped either a perineal, vaginal, or labial tear, and in these the average maximum of the first few days was 102.4°. In 23 cases of more or less perineal tear, where there had been no mechanical interference, the average maximum was 103.8°. In 7 slight perineal tears the average maximum was 102.6°, and in 11 cases of labial tear it was 103.7°. *In multiparæ*, the average maximum in 42 cases without any tear, was 101.2°; in 12 cases, with a slight perineal tear, it was 102.9°;

in 4, with more severe tears, 102.9°; and in 3 cases of labial tear, it was 100.6°. It will thus be seen that the temperature was markedly lower where there was no tear than where a deep laceration had occurred.

Forcep Cases. In the 6 primiparæ the average maximum was 104.1°, and in the 3 multiparæ it was 101.2°. In the former there was more or less laceration, and in the latter (occip-post) there was a tear in one.

In the large majority of cases the diurnal minimum was early in the morning, 2 or 6 A. M., and the maximum at 2 or 6 P. M., and, as a rule, the latter was higher than the nocturnal point at 10 P. M.

> "The lying-in woman is peculiarly liable to sudden and rapid rises of temperature, due to purely nervous causes. This is of great practical interest, and is important to bear well in mind in dealing with puerperal patients, otherwise, at the least, unnecessary alarm may often be caused."
>
> "Frequently a temperature that had been normal or nearly so, will be found to have quickly risen several degrees, even to 104° or 105°, and with this there will be found no physical signs or symptoms whatever that would account for it, the patient probably complaining of nothing beyond perhaps some headache and a feeling of restlessness. On examination the breasts will be found satisfactory; also the lochia. There will be no tenderness or distension of the abdomen; the bowels will be acting well, and the bladder empty; there will be nothing found wrong in the chest nor with any other organ, and yet the temperature will be perhaps 105°, when a few hours before it had been normal. In such cases, on careful inquiry, it will be almost invariably found that something has happened to disturb the patient's nervous system, such as a sudden fright, bad news, visit of friends, or perhaps there is trouble or anxiety. In these cases, when the fright is over, or the anxiety removed, the temperature again quickly falls."

Ten cases are given, in subjects varying in age from 18 to 34, to show from what agitating causes the temperature may be made to rise suddenly to an alarming point.

1. Primipara, 18; temperature 98° to 100°. On twelfth day after a dispute in the ward, it rose from 98° at 2 A. M. to 105° at 2 P. M., and fell again to 99° by 2 A. M. of the next day.

2. Primipara, 18; temperature 99.6° on seventh day, rose to 104.6° on eighth day from worrying about her nurse leaving, next day normal.

3. 4-para, 30; temperature normal on ninth day, rose to 102.6° after a fright from a nurse's nearly fainting.

4. 3-para, 34; frightened in her sleep by another patient calling out: temperature 99°, rose to 105°, fell to 100° in four hours, and to 98° in eight hours.

5. 2-para, 26; same disturbing cause, on eighteenth day, rise from 98.4° to 103.6°.

6. Primipara, 29, single. On ninth day read a novel, temperature normal, rose to 104°.

7. Primipara, 22. On eighteenth day temperature subnormal, rose to 104.8° after a visit from her husband; patient feeble, and made a poor recovery.

8. Primipara, 26, single; temperature 99° to 100° on tenth day, had visitors who brought bad news, temperature rose to 104.2°, next day 98°.

9. 2-para, 22. On thirteenth day temperature rose suddenly to 103.8° and remained high without constitutional change until the sixteenth day, when it fell to 98.6°; patient worried, cause not ascertained.

10. Primipara, 19. On tenth day temperature 98°, on eleventh day 101.2°, from same cause as in No. 7. On twelfth day received vexa-

tious news, temperature rose to 104.2°, fell to 98.4° next day after matters were settled.

These records show the importance of ascertaining, in any given case, whether there may not have been some mental disturbing cause to account for the increase of heat. In our hospitals, where the patients are largely of the Celtic race, and readily provoked or excited, we may meet frequently with sudden changes from fits of passion. After a visitation of puerperal fever in a lying-in hospital and its disappearance, the reviewer remembers to have been for a few moments alarmed by the rapid pulse and hot skin of a recently delivered woman, until he discovered that her passions had been aroused by some disparaging remarks made upon her baby by another patient. In the examples given, the rate of pulse should also have been recorded. It is possible even to be deceived by a coincidence between emotional and septic disturbance, and the invasion of the latter may be masked by the result of the former; it will be, therefore, very important to examine the patient with great care to be satisfied that there is no septic element back of the emotional, or excited into activity by the mental agitation. Cases of fright should be especially watched, as those of high violence are sometimes fatal.

The remarks of Dr. Champneys, of the aforementioned hospital, in discussing the paper, are worthy of note. He observed that—

> "The difficulties of diagnosis and prognosis centred on the third day, on which the bowels, the milk, and any surgical injuries would combine to raise the temperature. Indeed, the difficulty of diagnosis and prognosis was the chief difficulty in these cases, the treatment not admitting of much variation. In many cases, diagnosis and prognosis at the commencement of the pyrexia were impossible, but were best aided by the aspect of the patient, the character, rather than the rate of the pulse, and the tongue." . . . "Without a vaginal examination it was impossible to say that a rise of temperature was not due to pelvic inflammation; such inflammations are often quite ephemeral, and he had seen them run their course and end in recovery in three days; it had often occurred to him to find that a temperature which he had thought due to other causes was really due to pelvic inflammation." . . . "It is quite possible that a pyrexia due to psychical causes may lead to physical consequences, such as inflammation, or rather that the pyrexia and inflammation may be due to a common psychical cause." . . . "The great proof that these nervous temperatures were not due to septic absorption, as had been suggested, was, that he could recollect no single case of infection of one patient from another in the General Lying-in Hospital," and that during his service of three years "the mortality had been 1 in 130–40." . . . "Again, a rise of temperature for a few hours only can hardly be regarded as due to septic absorption. Rigors are no doubt alarming, but they are not at all uncommon immediately after labor, and often mean nothing." . . . "As regards fetor, it is useful as a means of attracting our attention, and such lotions as deodorize without disinfecting are positively injurious; they cut the rattle off the snake without drawing its fangs."

Auvard's Couveuse, or Nest.—For want of a better name, this "*incubator*," said to have been first used by Prof. Tarnier for affording artificial heat to premature and delicate infants, has been rearranged by Dr. Auvard, who has contrived an improved form, heated by five prismatic water vessels, and closed over the baby by a glass lid. This calorifier is said by Auvard to have reduced the mortality in the early weeks of infants under 2000 grammes from 65 to 38 per cent. To keep up a temperature from 86° to 93°, the water requires to be renewed in one vessel at a time every two hours. This form of apparatus, or some improved substitute, is particularly essential for the rearing of infants delivered after prematurely induced labor. One of our lamp-heated automatic incubators could readily be adapted as a baby heater, and would require but little attention after being properly adjusted for the reduced temperature. We should say that 86° ought to be quite high enough, as the baby is to be well encased in warm clothing. The hot air of the lamp would have to pass through a close metallic chamber encased by the crib-box, and that for respiration supplied from without, so as to be warmed by the chamber.

Spondylolisthesis.—The visit of Dr. FRANZ LUDWIG NEUGEBAUER of Warsaw to London, in April, 1884, was taken advantage of by him to bring up the subject of this peculiar deformity so carefully investigated by himself and a few others on the Continent before the Obstetrical Society; to exhibit a set of specimens; and to make searches for others in the anatomical collections of the British metropolis. One specimen of marked character was found in the Museum of University College, and is described with two wood-cuts on pages 152 and 153; it very closely resembles the illustrations of Kilian, Neugebauer, and Swedelin. What causes the slipping of the fifth lumbar vertebra over the top of the sacrum has certainly not been positively ascertained. Dr. Robert Barnes believes that it cannot be explained by one pathological process. In one case that came under his care it appeared to have arisen as the result of injury in a subject who had enjoyed good health until she married. "Dr. Neugebauer did not consider that spondylolisthesis ever resulted from the destructive processes of caries or necrosis of the vertebræ, but regarded it as essentially depending upon malformation and arrested development of the vertebræ, as exhibited in the specimens, although the displacement of a body of one of the vertebræ forwards might occasionally result from fracture through the arch of the vertebræ." In his opinion, based upon a study of numerous spinal columns, vertebræ, and pathological specimens, the slipping is due either "to a congenital deficiency between the superior and inferior articular processes on both sides, or fracture of the same parts." Predisposing causes he believes may exist throughout life, without displacement resulting, which he attributes to great weight in the abdominal region, general obesity, and repeated pregnancies, the inferior articular processes of the fifth lumbar vertebra not being sufficiently firmly united to the anterior part of the bone to keep it in place.

Dr. Neugebauer exhibited, in proof of his theory, nine specimens of vertebræ, one wax model, and about eighty photographs; besides photographic pictures of patients believed to be the subjects of the deformity. These having been submitted to a committee for report, it was decided that they sustained the views advanced by the exhibitor.

Dr. NOBLE SMITH reported as follows upon the University College specimen, above referred to, in which there is anchylosis as well as displacement.

> "There are two points in this specimen to which I would call attention: 1st, the elongated bony union between the superior and the inferior articular processes; and, 2d, to the firm osseous anchylosis between the posterior part of the body of the fifth lumbar vertebra, and the anterior part of the body of the first sacral. These conditions indicate a severe inflammatory process, and I should imagine that the anchylosis referred to probably indicates the existence at some time of caries of the two surfaces. But, even if caries has existed, I am inclined to think that this specimen is still in favor of Neugebauer's theory, and that probably in this case fracture took place first, and that caries occurred subsequently in consequence of the continued irritation between the two surfaces of bone."

Dr. SHATTUCK exhibited a fifth lumbar vertebra from an adult skeleton otherwise normally developed, in which there was an absence of osseous continuity across the arch immediately behind the superior articular processes, which is the congenital defect believed to favor the slipping of the vertebra from superincumbent weight, a displacement that is a very gradual one in some instances, as shown by the increasing difficulties of parturition from birth to birth in some multiparæ.

This subject has been one chiefly of quite recent investigation, and is still of somewhat questionable pathology. It becomes at this time of additional interest, because of the fact that a pregnant case of this displacement is under observation in this city, the subject being a German. It is proposed to bring on her labor prematurely.

Strong Mental Emotion affecting Pregnant Women as a Cause of Idiocy in the Offspring is the subject of a paper by ARTHUR MITCHELL, M.D., Commissioner of Lunacy for Scotland. No doubt emotional disturbance of the mother is credited with the production of much that probably does not belong to it, and we must look for the causes of idiocy in intemperance of parents, hereditary tendencies, injuries of the head in parturition, infantile diseases, etc. But there are cases in which there would seem to be no way of accounting for the idiocy, except through the effect of a maternal impression of a violent and depressing character. Dr. Mitchell says:—

> "I have convinced myself that cases do occur in which this accounts for the defect of the offspring; and I see no reason why it should not be regarded as sufficient. That which seriously disturbs the mother's health, which deprives her of sleep, takes away her appetite, interferes with the assimilation of her food, makes the secretions abnormal, and leads to emaciation, can scarcely do this and leave the progress of growth and development in the fœtus to be pursued in a vigorous normal way. The opposite, indeed, appears to be almost necessarily true; and it is impossible to estimate the measure of the ultimate misfortune which may arise from even a temporary check to the intra-uterine development of the child, because that development takes place in the healthy state with such extraordinary rapidity as practically to render fœtal life a succession of climacteric periods quickly following each other, when even the temporary negation of favorable conditions may be evidenced eventually in grave results."
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> "It has often been asserted to me with reference to an idiotic child under examination, that in the fœtal state it had received a 'shock' at a time when sudden terror or grief had perturbed its mother, and as a proof of this it was sometimes added that at the time of the mother's alarm or distress, the motion of the child became excessive, rapid, abrupt, and jerky, giving the mother pain, and that this excessive motion soon subsided, no motion being felt for days afterward. In considering the account given of such cases, it has appeared to me that the movements described were probably convulsive in their character, and if so, it can scarcely be doubted that such disturbances as would produce convulsions might inflict serious and irreparable injury on the delicate nervous system of the fœtus."

As sudden mental emotion is capable of producing miscarriage, either immediately or ultimately, the child in the latter case having ceased from a noted period to show signs of life, we may infer that an impression upon the fœtus short of fatal to it may result in imbecility. Very trivial causes have produced sudden miscarriage in nervous timid women; but we are not to credit such with the production of idiocy, although mothers are prone to attribute marks and defects in the infant to something of a trifling nature that may have happened to themselves during gestation.

In illustration, Dr. Mitchell reports six cases, which we give in few words:—

1. Wife of a fisherman who witnessed from the shore the drowning of her husband in a storm. She became terror-stricken, fainted, remained long in feeble health, and gave birth to a small weakly infant which proved idiotic.

2. A pregnant mother lost three children in one week by an epidemic fever, and became so grief-stricken and ill that she kept her room for several months, until she gave birth to an idiotic child.

3. A woman six months pregnant became frightened during an inundation, which threatened to overwhelm her house, and was additionally alarmed by the entrance of a strange man, who sat a short time by her fireside and abruptly left, having said nothing. Great agitation followed and continued for several days. The movements of the child in utero were observed to be quick and violent, and she complained of the pain they gave her. The fœtus was carried to maturity, but soon after birth was recognized as idiotic.

4. In this case the exciting causes were grief at the sudden death of her husband and anxiety concerning the support of her children, resulting in her own ill health. Child born at full period, was small and defective in mind.

5. Depressing cause, death of a child by the goring of a cow. Fœtal movement excessive and alarming; abortion threatened; child a choreic idiot.

6. Woman alarmed and excited by her horse running away, which resulted in the death of the animal, although she escaped physical injury. Child born at maturity, was partially paralyzed, and became a complete idiot.

These cases were selected from 443 of idiocy and imbecility consecutively examined, and the views of the author were deductions from more than 1500 cases.

Although the cases given are in many points striking, the general opinion brought out by the discussion was that the question was "non proven." In order to make the connection between cause and effect unquestionable in such cases, several points should be noticed.

1. Was there any hereditary predisposition that might be credited to the effect of intemperance, insanity, imbecility, paralysis, or epilepsy?

2. At what period of utero-gestation was the depressing or alarming cause brought to bear upon the mother?

3. What proportion of mothers bear idiots, and what do not, under the circumstances that appear to have produced the mental defects in the offspring of the six cases cited?

Some years ago, an inquiry was instituted in the Rotunda Maternity of Dublin, and 2000 women were inquired of as to their emotional disturbances during gestation. In a number of instances fears existed as to the coming fœtus, on the part of the mother, but no baby was marked in correspondence with any previous excitement, longing, or emotion. It would be of interest now to institute a more extensive inquiry in a number of hospitals, covering thousands of cases, to ascertain the possible connection between fright, grief, and ill health produced by emotional causes, and idiocy in the offspring.

Case of Extra-Uterine Gestation.—Delivery of a living child per vaginam, removal of placenta, recovery, is reported by Dr. J. H. MATHIESON, of St. Mary's, Ontario.

As this operation was performed in Canada, and has been repeatedly noticed in journals, we shall describe it in few words, being more interested in its scientific connections than in the operation itself.

The patient was a five-para of thirty, and had gone to her full term at the time elytrotomy was performed, having been under observation for more than sixteen weeks. Several attacks of pseudo-labor had taken place during the last month, until, on June 28, 1881, her symptoms became so alarming that delivery by the knife was determined to be entered upon at once, which was done without anæsthesia, the patient opposing its use. After the cyst was opened through the vaginal wall, the fœtus was delivered by the forceps, lived, was a male of 8 lbs. 7½ oz., and perfectly formed. The funis was short, and placenta in three lobes; it was located on the posterior left side of the cavity, and its lower border was about two inches from the margin of the incision. After the patient rallied, the placenta, which was easily detached, was carefully separated little by little, a sponge containing solution of perchloride of iron being applied to the uterine wall as each portion was peeled off. The loss of blood was trifling, and in half an hour the patient was bandaged as after a normal labor. Although much exhausted and her condition alarming, the patient reacted and made a good recovery; but two years passed by before she had fully recovered her health; the child was living in August, 1883.

This case had its counterpart in one reported by Dr. John King, of Edisto Island, upon which he operated by the same method in 1816, saving mother and child; delivering by the forceps and removing the placenta without hemorrhage. Other cases of puerperal elytrotomy have been less fortunate, the child having been lost, and the mother perishing from peritonitis.

Dr. Mathieson operated during the life of the fœtus, because the woman was *in extremis*, and removed the placenta at once, fearing septicæmia more than hemorrhage. The patient had a mild peritonitis, and might have perished had there been a decomposing placenta in the cyst. His injecting Condy's fluid into the cyst was done with safety, because it was perfectly closed from the peritoneal cavity; but in a case in this city, where the sac was open above, a weak antiseptic injection caused the death of the patient. The reviewer believes, with Dr. Bantock, that this was probably a case of what is known as the *Interligamentary or Extra-peritoneal* variety of pregnancy, in which the fœtus is inclosed between the laminæ of the broad ligament, the ovum originally in the Fallopian tube having passed through its lower wall and become developed beneath it, the original Fallopian cyst being still a part of the fœtal inclosure. The tumor was so situated that "its long axis nearly occupied the position of a line drawn from the centre of Poupart's ligament on the right side to the tenth rib on the left." We believe that *primary* puerperal elytrotomy is as a rule much less fatal than *primary* laparotomy in cases of abdominal pregnancy, but we deprecate the plan of peeling off the placenta or injecting the cyst. In one case examined by the reviewer, a knuckle of intestine occupied a hole in the cyst wall and projected into the sac, like a small hernia. At all other points the cyst was perfect.

Post-partum Avulsion of the Uterus, with a case followed by recovery, is reported by J. Hopkins Walters, M.R.C.S. The patient was a married woman of 22, delivered of her third child by a midwife on April 18, 1882, and was first seen by Mr. Walters twenty-one hours after the injury. Her labor was natural and lasted twenty-two hours; she was a small delicate woman; the placenta was retained, and the midwife, in attempting to remove it, tore away the uterus, with the lateral ligaments of one side, leaving about four inches of omentum hanging from the vagina. The specimens were preserved by Mr. Cochran, who was called in, and are represented by an accurate wood-cut in the Transactions. The mass consists of the uterus; part of the peritoneal covering of the bladder, five and a half inches long; a semicircular flap of the posterior vaginal wall, an inch and a half in length; half an inch of the ligament of the left ovary; one inch of the left Fallopian tube; four inches of the left round ligament; the entire right broad ligament; with four inches and a half of the round ligament; the ovary with its ligament, and the entire Fallopian tube. The mass, as now preserved in the Museum of the Royal College of Surgeons, measures 6½ inches in length, 4½ in breadth, and 2½ in thickness; the uterus was not inverted.

When Mr. Walters saw the woman she had reacted in a measure, but still had a pulse of 120, with an apparently normal temperature; fourteen inches of omentum protruded from the vulva, which was followed up by the hand into the rent through which it came. This had been twice returned by Mr. Cochran, but failed to remain. Mr. Walters therefore ligated it in five portions at the level of the vulva, and cut away the protruding section, leaving the balance within the vagina.

Notwithstanding the nature and severity of her injury and the fact that upon the fifth day her pulse rose to 170, and her condition appeared hopeless, the patient recovered, being able to sit up at the end of the third week, and to ride five miles to a hospital in four weeks, where she was directly under the care of Mr. Walters for seven weeks longer. The omentum in the vagina gradually disappeared, until by the end of June it no longer could be distinguished. The vagina was left attached to the surrounding tissues at its upper part, and was four inches long.

The midwife stated that she waited ten minutes after the birth of the child for the placenta to come away, then pulled the cord, which broke short off,

> "then introduced her hand within the vagina, pressing above the pubes with the other, and feeling a hard substance, which, having no cord to guide her, she imagined to be the placenta, took hold of it and tried to get it away. The patient was very refractory, and begged to be allowed to rest, so the midwife withdrew her hand for a time. She then made a second attempt, the patient being on her left side, with her knees drawn up and her feet planted against the bottom of the bedstead. Having introduced her hand, the midwife made suprapubic pressure and took hold of the lump, when the patient made a sudden spring, and the midwife's hand and the lump came away together."

A singular feature in the record of this case is the fact that the uterus was not inverted, and that the placenta was expelled and came away when the torn parts were removed. Everything removed was placed in a vessel (the midwife not being aware of the mischief she had done), and not again touched until examined by Mr. Cochran, who was summoned by the patient's mother, her fears being aroused by the condition of her daughter, and by finding the protruding omentum, when she looked to see whether she was flooding.

In examining the records of cases of uterine avulsion, Mr. Walters could find but two other instances out of thirty-six in which the uterus was undoubtedly not inverted, one of which recovered. Of the thirty-three cases believed to have been inverted, thirteen recovered. In a very few cases was the removal completed without the use of scissors or knife.

It does not appear probable that the midwife could have removed all the parts noted, by simply grasping the cervix, even if she had forced her fingers through the vaginal wall. From the fact that the vagina was torn from the anterior part of the cervix close up, as it is in many cases of laceration produced during labor, it would appear probable that there had been such a rupture, and that the hand of the midwife had been passed through it under a belief that it was entering the uterus. This was the opinion expressed by Dr. J. Braxton Hicks in the discussion, and would appear to be a proper explanation of the difficulty.

The question of the amount of force used in tearing away a uterus is one very difficult to determine. Where the uterus is inverted, and all the parts in a normal degree of soundness, one would suppose it would require the exercise of great force to tear out the organ from its attachments. But, should the parts be softened by disease, and the cervico-vaginal connection be lacerated, as has sometimes happened, a moderate degree of force, aided by the patient bearing down, might suffice to bring the uterus through the vulva; and there are cases upon record where this has happened in the hands of physicians, as witness the celebrated case of Mr. Popplewell, 1868, where the uterus was not inverted, and was drawn out by traction on the cord, the placenta being within it. Dr. Barnes believed, in this case, that the parts had been lacerated in the delivery of the fœtal head by the forceps, and that traction on the cord merely completed the separation. Dr. Hicks had held the same view. Mr. Popplewell assured the witnesses in his defence in his trial for manslaughter that "the whole uterus came away quite easily."

Fifty pages of the volume under review are occupied by a paper from Dr. GRAILY HEWITT, *On the Severe so-called Uncontrollable Vomiting of Pregnancy*, which we cannot do justice to in an abstract form, particularly as the discussion upon it occupies eighteen pages more; we therefore would refer the reader to the original article, which presents new views upon the etiology of the diseased condition. R. P. H.

ART. XXVI.—*A Handbook of Ophthalmic Science and Practice.* By HENRY E. JULER, F.R.C.S., Junior Ophthalmic Surgeon to St. Mary's Hospital; Senior Assistant-Surgeon and Pathologist to the Royal Westminster Ophthalmic Hospital; Formerly Clinical Assistant at the Royal London Ophthalmic Hospital, Moorfields. 8vo. pp. 467. Philadelphia: Henry C. Lea's Sons, 1884.

THIS work is something more than its modest title indicates, and will take rank as a valuable text-book. Ophthalmological publications have of late years followed each other in such rapid succession that we can scarcely look for anything new in a work of this kind, but Mr. Juler's book is fully up to the times, and he has not only presented the latest conclusions of Continental authors, but has drawn from his own experience and that of his colleagues.

There are good concise descriptions of the anatomy of the different parts, which, as well as those of various pathological conditions, are freely illustrated by excellent woodcuts. All of the colored plates, however, are not so good. Those representing diseases of the cornea, iris, and lens are glaring and unartistic, and some of them would scarcely be recognizable if separated from their labels.

As is usual in English text-books, the treatment recommended corresponds very closely with that followed in our own hospitals, but there are some points of difference. Instillation of atropia and insufflation of calomel, which are used almost as a matter of routine in phlyctenular conjunctivitis and keratitis, are not mentioned by the author. There may be some difference of opinion as to reliance only on mercury, to the exclusion of iodide of potash, in chronic interstitial keratitis; but those who have noted the rapidity with which large gummata of the iris will sometimes melt away under the use of heroic doses of the iodide will be astonished to find no reference made to it in the treatment of specific iritis. We believe that most American authorities are much less confident than the author of the propriety of iridectomy in serous iritis and chronic iritis with synechia, and that many of them would look upon the insertion of a seton in the neck or temple for the cure of ulcer of the cornea almost as a relic of barbarism. The extraction of monocular cataract, when the other eye is unaffected, is generally considered a doubtful and somewhat dangerous procedure, and perhaps few surgeons hasten to perform it in dread that "delay in extraction might cause the eye to become amblyopic from disuse," as the *passive* suppression of vision by an opaque lens is not thought to have that effect. We were disappointed not to get the views of the author and his colleagues on the subject of preliminary iridectomy.

The chapter on refraction and accommodation and the use of the ophthalmoscope has been carefully prepared jointly by Mr. Juler and Mr. Adams Frost, and will be found a valuable assistance to the student. It is preceded by a brief exposition of the optical principles having special relation to the physiology of vision.

The chapter on color-vision and its defects, prepared by Mr. Frost, gives the best concise practical summary of the subject that we know of.

The American publishers have produced a most creditable volume. It is beautifully printed on good paper, and is unusually free from typographical errors. G. C. H.

ART. XXVII.—*A Treatise on Amputations of the Extremities and their Complications.* By B. A. WATSON, A.M., M.D., Surgeon to the Jersey City Charity Hospital, to St. Francis's and to Christ's Hospital at Jersey City, N. J., Fellow of the American Surgical Association, etc. Illustrated by upwards of two hundred and fifty engravings, and two full-page plates. 8vo. pp. 750. Philadelphia: P. Blakiston, Son & Co., 1885.

IT would seem that within the compass of the 750 pages of this volume space would be found to write upon every subject of interest connected with amputations; and in the main this expectation is realized. How well each portion has been treated we shall endeavor to indicate. At the outset we must express our regret that the proof has been so carelessly revised, for the errors are glaring and numerous. We must also protest against the addition of strange titles to the names of gentlemen so well known as *Mr.* Hilton, *Mr.* Holmes, *Mr.* Gray, etc. We were much surprised to meet with the name of a *Doctor* Hilton, a *Doctor* Le Gros Clark; but when we came to the Anatomy of *Doctor* Henry Gray, F.R.S., we were fairly puzzled at first to know who the author referred to was, while, when *Mr.* Pirogoff and *Doctor* Timothy Holmes were mentioned, we were lost in astonishment at the new titles appended to familiar names.

We are distinctly in favor of giving every author his due, and, when necessary, quoting him verbatim, but we think that more references by foot-notes would have been better than the many dozens of pages of literal quotations indulged in by Dr. Watson. The first sixty-one pages are devoted to a dissertation upon the history of amputations, the various methods of operating, the management of the stump, etc. The author unreservedly recommends Davy's lever as a means of controlling the circulation in amputations at the hip-joint. This, we believe, is unwise advice, since in more than one instance fatal damage has been done.

The second chapter deals with conditions affecting the results of amputations, wherein the author states that he has arrived, among others, at the following conclusions, founded not only upon study, but clinical experience:—

> "That there is no more favorable period for the performance of surgical operations than that between the ages of five and fifteen years.
>
> "That the average annual rates of mortality for various ages and different periods may be received as a relative guide in cases of severe injuries and surgical operations as far as age and sex have a bearing on the question of life and death."

The remainder of this chapter does not contain anything new of special interest, being chiefly composed of pages of quotations from Paget, West, Erichsen, Gull, Mahomed, etc. Strong emphasis is laid upon the importance of a thorough examination of the urine before operating. The necessity of such a rule has been lately forcibly impressed upon our minds by a case where this was omitted, in the practice of another surgeon, and where death resulted in a few days from unsuspected glycosuria.

In chapter third good and conscientious advice is given with regard to the position of the surgeon in advising or opposing amputation.

On page 110, Dr. Watson shows that injustice has been done to Faure by the statement that he advocated delay in amputating, although from the first such an operation was absolutely necessary. His real position is indicated by the statement that he considered that the additional shock of an important operation should not be at once superadded to that of a severe injury, and by the perusal of the following exceptions to the rule of delay.

> "1. When the limb has been torn from the body; 2. When a comminuted fracture involves a large articulation, whether caused by gunshot wound or otherwise; 3. When an extremity is almost destroyed, the bone being extensively comminuted with considerable loss of the soft parts; 4. When the bones are extensively comminuted and the adjacent tissues are injured and contused, with destruction of the tendinous and aponeurotic structures; 5. If a fracture involves an articulation even in the slightest degree, with a considerable destruction of the ligaments of the joint; 6. Hemorrhage from an arterial trunk of an extremity which endangers the safety of the patient, and cannot be controlled except by amputation."

By a full-page quotation from Hennen the author apparently awards to the English military surgeons the priority of the practice of immediate amputation as the rule in military surgery. We have always been, and still are, under the impression that the establishment of this practice on a firm basis was due to the elder Larrey, for, although it may have been true that primary operations were frequently performed by British army and naval surgeons, yet the chief authors of that time were opposed to the practice. We cannot but think that the peculiarly partisan feelings of the time have tinctured the writings of British surgeons, so that, while primary amputation may have been a fairly general *practice*, yet it was not authoritatively *taught* by the leading surgical writers, nor was it reinforced by those best of arguments—extended facts and experience.

The division of amputations into "immediate, primary, intermediate, and secondary," or "primary, intermediate, and secondary," is condemned by the author, as he contends that "the words themselves, as commonly employed, fail to convey to the ordinary professional mind the faintest idea of the pathological conditions, but do commonly suggest certain periods of time." True, but does the author's nomenclature do more, which has to be defined, as far as the "primary" class goes, by two pages of quotation from Hamilton, etc., and five or six pages of comment thereon? The point the author makes seems to be that a "primary" amputation is one done before there are any symptoms of "septic" infection, whether this be ten minutes or ten days. We think that in practice all successful surgeons recognize the fact that "primary" does not refer to any special time, but as to whether fever and local inflammatory, *i. e.*, septic changes according to Dr. Watson, have set in, and that in individual patients and under different circumstances the time of onset of the symptoms varies exceedingly. The author appears—we use the word advisedly—to call those amputations commonly termed "intermediate," *i. e.*, during the existence of decided inflammatory—septic—symptoms, "secondary." We think this change of terms unfortunate, to say the least. There certainly is a point when what of fever remains after an injury followed by free suppuration, is that commonly called "hectic," which, although it may be in modern scientific language "*septic*," is not commonly so received, nor should it be so treated. We fear that "the ordinary medical mind," as Dr. Watson calls it, may be misled by his new classification into temporizing instead of boldly removing the source of the trouble.

From the pages upon pages of conflicting quotations cited by the author, we are confessedly so confused as to be uncertain whether he thinks an amputation in the continuity or the contiguity of the bones is to be preferred: we *think* he prefers the former. Our personal experience must certainly be peculiar, as one of the objections against amputating through a joint has never troubled us, viz., the large number of vessels to ligate, which, the author says, render the operation peculiarly dangerous from secondary hemorrhage. There are, in certain disarticulations for disease, many vessels to tie, but when done for accident they are of small size, and when requiring ligation are *not* those which usually give rise to secondary hemorrhage; this is a theoretical, not a practical objection.

The author is at much pains to show us that the musculo-cutaneous flap operation is more dangerous than the plain cutaneous flap, giving many authorities to prove that both the arterial and venous supply of the skin of the extremities is "essentially independent of the muscular," so that, greater safety lying upon the side of cutaneous flaps, we need not be deterred from performing such operations by the risk of sloughing. We doubt this latter, but, after so much space devoted to the consideration of the source of the blood supply, we are surprised that the inexperienced operator is not warned against the common blunder of "scoring" the subcutaneous tissue in which the cutaneous bloodvessels ramify. This is a most pardonable mistake for those unwarned, since every student is taught to cut against skin or fascia in order to make a good dissection of his muscles. This is not a trivial point, and a far more important direction to give to young operators than appears at first sight.

Dr. Watson's conclusions are as follows:—

> "1. The circular amputation (cutaneous flap) is less liable to be followed by septic infection, inflammation, gangrene, and sloughing, and therefore ought to be preferred in all cases where the surgeon is entirely free to choose, if there exists any special danger of these complications which cannot be successfully counteracted by other means. 2. The flap amputation (musculo-cutaneous) supplies those conditions most favorable to immediate union, especially in the thigh and arm, and therefore it ought to be preferred unless this advantage be counterbalanced by the danger arising from complications peculiar to this method of operation. 3. The success of an amputation does not depend so much on the method of operative procedure as on the care exercised in the performance of the operation and the after-treatment." . . . . "It occasionally happens" . . . . "that a surgeon finds himself unable to follow any particular method," etc.

Very excellent advice most of this is, but surely not demonstrative of the author's belief that the musculo-cutaneous flap is a dangerous method of amputating, since he *advises* it in the most dangerous amputations, *i. e.*, those of the arm and thigh! The directions as to the administration of anæsthetics are very commendable.

On page 163 is a cut called "Pancoast's Aortic Compressor." This is a mistake. The cut represents *Lister's* instrument, which is nothing but a large Hoey's clamp, while Pancoast's instrument—and we speak advisedly, having used the original instrument in one of our own hip-joint amputations—consists in the addition of another pad to a large Skey's tourniquet. Many good devices are suggested, both in the text and by the cuts, for the arrest of hemorrhage during amputation, but one of digital compression of the femoral artery indicates a point for pressure some inches below the pectineal eminence, requiring powerful pressure to control bleeding, while if the vessel be pressed against the pelvic brim hardly any effort is requisite.

We are entirely at a loss to understand why Emmet's "twisting forceps and shield are required in the practice of antiseptic surgery whenever metallic wire is employed;" indeed we not only deny their necessity, but can see no possible use for them. In like manner we cannot see why an antiseptic amputation "generally precludes the use of retractors" any more than the use of a knife or sponge. If the operator be not satisfied with the disinfection effected by soaking the retractor in his antiseptic solutions, he can make use of one or more layers of his antiseptic gauze. Neither can we see the slightest objection—when necessary—to the surgeon's lending a hand in restraining for a moment or two the struggles of the patient on the plea that it may "render his hand unsteady, and thus incapacitate him in a degree for handling properly the required instruments." Steady hands are good to have, but are certainly not essentials to the performance of such a coarse operation as an amputation, and we have certainly seen some admirable operations performed by surgeons whose hands were habitually unsteady. We would suggest a small piece of wax attached to a wire and rendered plastic by heat, to control bleeding from the bone rather than a compress. The method of using the drainage-tube, figured on page 183, is open to criticism, and it contravenes the specific directions of Lister. In the cut it traverses the stump from side to side like a seton and acts not unlike one. The objections to this method are so manifest that many operators discarded it years ago. Tubes—as many as seem requisite—should be introduced down to the cavity around the bone and then cut flush with the surface. At the first dressing they can be readily removed, their perviousness determined, and then they can be shortened and replaced, none of which things can be done by the "seton plan," besides the risk of pulling ligatures off, breaking up adhesions, and giving severe pain during the removal of the single long tube. We are surprised at an enthusiastic Listerian, like Dr. Watson, overlooking such an important point, and we are sure that he does not dress his own amputations in this way. Of the various amputations of the hand we have nothing to say except that the descriptions are similar to those usually given, and that one or two useful forms are not mentioned.

Disarticulation at the wrist is considered a better operation than that through the lower part of the forearm, but the extraordinary statement is made, in this connection, that "the radial, ulnar, and interosseous arteries may require to be tied." They certainly must be sought for and tied if divided, whether they bleed or not. Of course the author means that the only vessels which may be cut are the branches of the palmar arch and the dorsalis indicis, princeps pollicis, etc., but the language is dangerously inaccurate in view of the construction which may be put upon it by certain literal-minded readers.

In amputations above the shoulder-joint, Dr. Watson seems only to have consulted the older editions of certain books, not bringing the operation later down than 1872. Although quoting in other places a book published in 1881, viz., Vol. I. of *The Encyclopædia of Surgery*, he fails to see that the list there embraced eighteen cases instead of fourteen, and had he consulted the current literature since that article was written, he would, we opine, have added to the list. It is a noticeable fact, throughout this book, that most of the authors referred to have gotten out later editions of their works than those quoted by Dr. Watson.

The lines given in the cuts for the flaps in Lisfranc's and Chopart's operation when performed for injury, do not appear to us to be the most approved, and we believe that when such an amount of dorsal tissues remains, the metatarsus should be sawn through in front of the articulations. The curious part is that Dr. Watson gives two sets of illustrations which differ most widely in the position of the incisions. We cannot agree with him that the drawing up of the heel in Chopart's operations is "always *amenable to treatment*;" the italics are the author's. Instead of giving Syme's own description of his amputation at the ankle, he quotes that of another author, which materially modifies and renders it more difficult of performance; but space forbids further comment.

We leave much unsaid about the omission of certain methods of amputating to call attention to several facts concerning amputation at the hip-joint, which, from some of the advice given, the author seems not to have performed himself. The abdominal tourniquet is directed to be applied to the left of the umbilicus. Mr. Lister has shown, by the examination of thirty bodies, that in fifteen, the aorta was absolutely median, in thirteen it deviated more or less to the left, and in two slightly to the right. We have ourselves seen the tourniquet fail to control the circulation when applied in any but the median line. Dr. Watson also describes as preferable a combination of Guthrie's and Béclard's method, wherein the bone is disarticulated last, an operation possessing nearly all the disadvantages of both methods. We do not pretend to say that Liston's method is the best of all the coxo-femoral disarticulations, but if a transfixion flap operation is to be done it is far the best; we speak from experience, having tried both methods on the living subject. The mixed method is clumsy, slow, and in consequence, should the circulation be not well controlled, much hemorrhage may ensue, while the bulky, rather uncertain-shaped flaps remain, which latter objection is done away with by Guthrie's plan. A most serious omission has much surprised us, viz., the entire absence of any proper information as to the mortality incident to the various amputations. Absolutely no statistics drawn from civil practice are given, although a few from military practice are incidentally mentioned—a fatal oversight in a work of this kind.

Chapter VI., of forty odd pages, contains a large amount of interesting information concerning spontaneous generation, various wound dressings, etc., and yet, by omitting the results of some of the later researches, it lacks completeness. The succeeding chapter is devoted to Lister's antiseptic treatment of wounds, Guérin's cotton dressing, O'Halloran's open method, and the various modifications of the antiseptic method.

The perusal of this and all other sections of the book impresses us with the idea that the work has been written *by sections* during a number of years, and that they have not been recently revised. Thus, carbolized catgut ligatures are declared to be the only ones proper for antiseptic use. Lister's chromicized gut, the corrosive sublimate gut preserved in juniper oil, etc., are all ignored. No mention of boracic acid, iodoform, or corrosive sublimate gauze is made. Only vague directions are given for the manner of placing drainage tubes, and catgut drains are mentioned without stating that they can only be used alone where the most perfect coaptation is possible, and in consequence but little serous or other discharge is to be expected. Guérin's cotton dressing is minutely described, but the time for its removal is not given—an essential point. By one of the methods suggested it would have to be changed a number of times; by the original method not so. The author's estimate of the open method and of Listerism is most judicious. His description of Callender's method is incorrect. Callender, when possible, swung the limb not only *after*, as Dr. Watson says, but *before* the operation. The wound was washed out with a 30 to 40 grain solution of zinc chloride, bandaged to the splint, and so dressed that only that portion of the dressings over the immediate line of the wound needed to be removed when soiled. A silver drainage tube of peculiar construction was used, and the wound was cleansed by a camel's-hair brush, kept during the intervals in a test-tube containing a strong spirituous solution of carbolic acid. Although water dressings are mentioned, antiseptic irrigation is not.

The advice contained in the following sentence strikes us as most mischievous: "Reaction having been established at the expiration of the first twenty-four hours, the patient should then receive a cathartic, unless contraindicated by previous treatment, or the existing state of the bowels." Surely in a pathological amputation the bowels should have been attended to before operation, and equally surely, after a severe injury demanding the removal of a limb, all unnecessary disturbance should be avoided for a longer period than the first twenty-four hours. Conical stumps, changes in stumps, and the selection and application of artificial limbs form the contents of chapter eight. The portion treating of artificial limbs, which is well and profusely illustrated, the author informs us, "is essentially a translation from the Arsenal de la Chirurgie Contemporaine, by Gaujot et Spillmann, tome ii., Paris, 1872." Why is the title part English, part French? This subject has devoted to it 131 pages, and forms one of the most interesting and valuable portions of the book.

Chapter IX. deals with shock, accidental hemorrhage, traumatic delirium, "an experimental inquiry into the etiology and distinctive peculiarities of traumatic fever," and secondary hemorrhage. As usual, the quotations are extensive, but the latest writer and authority on the subject of shock is not mentioned. The author believes, with Earley and Hunter McGuire, that large doses of quinine act as a prophylactic against shock. This may be true, but we are surprised to learn that "the administration of a cathartic," so "as to secure its complete action about twenty-four hours before the performance of a surgical operation, exerts unquestionably a very favorable prophylactic influence; and the same may also be said in regard to withholding all solid food from the patient for several hours prior to the operative procedure." The advice is excellent, but we cannot see how these measures are *prophylactic.*

Dr. Watson indorses Mr. Gant's advice—to use electricity and artificial respiration in shock with failing heart's action. Now the latest teaching and experience go to show that the employment of electricity is not only useless in most cases, but often positively injurious. We are more than dubious whether a discharge from an amputation wound is ever "mucous," as asserted on page 517. Space fails to go into details of the author's teachings and extensive experiments with reference to traumatic fever, except that Dr. Watson has been "led by his own investigation to believe that the cause of this (aseptic) fever should be sought for in the action of the carbolic acid in the wound secretion aided by the air; while the absorption of the new product is unquestionably the first step in the development of the morbid condition." If this be the correct explanation, what causes the aseptic fever of those dressed with iodoform or corrosive sublimate? The author again wishes to change the meanings of accepted terms, and prefers "accidental" to "secondary" for those hemorrhages which occur some time after accident or operation. Our verdict is, "not proven."

Chapter X. is devoted to pyæmia and septicæmia, wherein we are surprised to find no mention of either the action of the ptomaïnes or micro-organisms, although both are mentioned forty or fifty pages later, when speaking of other wound-complications. We are also disposed to question the statement that there is "a steady increase in the number of pus or white-blood corpuscles in the blood of pyæmic patients." There is, as we have shown years ago by actual observation, an increase of white cells in all inflammations accompanied by high temperature—which is certainly a marked feature of pyæmia; but we deny, not only here, but elsewhere, the correctness of the author's pathology, which seems to us a reversion to the teachings of twenty years back. Ichorous pus in the venous circulation is declared to be the cause of pyæmia, producing "wedge-shaped clots." A clot in a vessel can certainly never be wedge-shaped, the phenomenon the author refers to being caused by "collateral hyperæmia." A positive post-mortem diagnostic point between pure septicæmia and pyæmia is said to be the non-coagulability of the blood in the former, and hyperinosis in the latter. Is this a reliable point? We think not. Quotations upon quotations, with separate comments upon each, only serve to confuse, especially since the author occasionally, either partially or completely, contradicts on one page what he has affirmed upon a preceding one, until we feel reluctantly forced to declare this to be the most unsatisfactory chapter in the book. What are we to think of the author's pathological views when the following sentence is to be found in his description of the symptoms of pyæmia? "There is a steady diminution in the number of red corpuscles, a steady increase in number of the *pus*—or *possibly*, white corpuscles;" the italics are our own. The prophylaxis of septic diseases is clearly and succinctly given.

Much space is devoted in Chapter XI. to the consideration of erysipelas, hospital gangrene, gangrene, and osteo-myelitis. Erysipelas is most thoroughly considered, so that the only criticism we have to offer is that the author treats of its every possible or conceivable variety, instead of restricting himself to erysipelas as a complication of amputation.

In the section upon gangrene, which is a most excellent one and replete with judicious advice, Dr. Watson affirms "that the deleterious agent arising from the decomposition of animal matter is a *contagium vivum*, and *not a chemical poison*." While not denying the truth of the author's proposition, it is clear that when he wrote this portion of his book he was not familiar with the extensive investigations concerning the ptomaïnes, some of which assuredly *can* produce the constitutional symptoms of gangrene.

The lithographic illustrations of osteo-myelitis are models of artistic work, and, with the exception of the pathology, the description of osteo-myelitis is an excellent one.

And now, when we come to sum up and express our opinion of this work, we feel much at a loss. Much labor, research, over-much quotation, and theory have all been brought to bear, but, instead of a contribution of something new, of the results of the author's own personal experience, we have mainly a compilation. C. B. N.

ART. XXVIII.—*Health Reports.*

1. *Sixth Annual Report of the State Board of Health of Illinois, with two Appendixes: A. Conspectus of the Medical Colleges of America, revised to Dec.* 20, 1884; *B. Official Register of Physicians and Midwives in Illinois, revised to Dec.* 1, 1884. Springfield, pp. 587. 1884.
2. *Seventh Annual Report of the State Board of Health of the State of Connecticut for the Fiscal Year ending Nov.* 30, 1884. New Haven, pp. 385. 1885.
3. *Tenth Report of the State Board of Health of Minnesota for the Period between Jan.* 1, 1883, *and August* 1, 1884. St. Paul: Pamphlet, pp. 435. 1884.

1. THE *Illinois* Report giving the history of another year's progress in the good work of elevating the standard of medical education in the

United States opens with a brief *résumé* of various steps which have been taken and the success which has attended the praiseworthy efforts of the Board. As is well known to the medical profession, a schedule of minimum requirements, to be insisted upon by medical colleges in order to obtain recognition for their graduates from the Illinois Board of Health, was announced in 1880, and after three years' publication and notice, compliance with this schedule was last year made the test of approval. Out of forty-seven colleges whose diplomas have since been presented, twenty-six have so far complied as to warrant the acceptance of their diplomas. In the remaining twenty-one cases the diploma has been accepted as evidence of the applicant's proficiency in the branches or subjects claimed to be taught by the given college. "But certificates (entitling to practice in Illinois) are issued to such applicants only after they have passed a satisfactory examination by the Board in the branches or subjects omitted by their respective schools." As yet the Board has not made a three years' lecture course obligatory, although strongly recommending it, but it does insist upon the preliminary education requirement, and on the study of hygiene. As a result of this just demand upon the colleges of the country, the number of medical schools exacting evidence of preliminary education has risen from fourteen in 1880 to ninety in 1884, and those giving prominence to the study of hygiene and preventive medicine, from seventeen in 1880 to eighty in 1884. Of the fraudulent institutions which existed only for the sale of the patent diploma, it is not known that a single one now remains in existence; the bogus Boston "Bellevue," exposed by the Board in 1882, and the Milwaukee College of Medicine and Surgery, exposed in 1883, were the last of the brood. Although it must be admitted that part of the improvement mentioned is apparent only, and though it reads well in college prospectus and announcement, it is often ignored in spirit and in practice; yet, making whatever allowance the most skeptical may demand, there still remains a substantial gain in the methods of medical education in this country during the past four years—a gain, moreover, in which there is brilliant promise for the future. Indeed so great has been the success, that the Commissioner of Education cites the regulation of practice of medicine in Illinois as a solution of the difficult problem as to how we may protect the public without assailing the right of personal medical judgment, and remarks that, under the method of procedure adopted, it is obvious that men of inferior attainments will be forced to prosecute their studies until they have attained a sufficient amount of knowledge to satisfy the requirements of the Board of Health; that medical colleges in the State and in surrounding commonwealths will be stimulated to increased exertions in order to prepare students for the ordeal; and that quack pretenders and rascals will gradually be forced out of the boundaries of Illinois.

The series of preventable disease publications prepared and distributed by the Board have been highly appreciated, and it is believed that an immense amount of good has been accomplished by these means of disseminating among the people such knowledge respecting diseases, and such instruction concerning hygiene. So many urgent requests have been received for these publications in other languages besides English, that the Board has been compelled to issue a German edition, and also a translation into Scandinavian of the pamphlet on the Prevention of Smallpox.

Owing to the want of adequate legislation concerning diseases of domestic animals, the Board has been called upon to take action for the suppression of outbreaks of contagious glanders among horses in various parts of the State. Two fatal cases of the disease in the human subject, furnished the Board of Health with sufficient warrant for its course, and the General Assembly which was in session at the time they occurred, promptly amended the so-called pleuro-pneumonia act—which created the office of State Veterinarian—so as to make its provisions apply also to glanders.

A few deaths from trichiniasis, and the fact that some of the European governments have interdicted the importation of American pork and its products, led to the publication of results of the indefatigable Secretary's investigations during the past eighteen years concerning the prevalence and sanitary importance of trichina in Illinois. These conclusions were substantially, that American swine were less apt to be affected with trichina than those of other countries, and that in every case of trichiniasis investigated, the disease arose from eating raw or imperfectly cooked meat.

Besides the interesting record of the proceedings of the Board in detail, the main body of the book is made up of the invaluable Conspectus of the Medical Colleges of America, revised up to Dec. 20, 1884, and the Official Register of Physicians to whom certificates have been issued in Illinois, the latter of which is also published in a separate volume.

2. The Report from *Connecticut* commences with an apology for deficiencies and imperfections on account of the sudden death of the late secretary and executive officer, Dr. C. W. Chamberlin, in the midst of his usefulness, and before he had prepared any part of the annual report in a form which could be utilized by his successor.

From the replies of correspondents throughout the State it appears that dysentery has been more prevalent during the past year, in this respect following the usual rule of being more frequently met with here in cholera seasons abroad. This relation of increased prevalence of diarrhœal diseases to cholera has been wisely urged by the board upon the community in order to promote the general enforcement of measures for energetic, public, and private sanitation. Malarial diseases during 1884 have declined in frequency, and a proportionate increase of typhoid fever seems to have manifested itself in many towns. "Taken in the aggregate the health of Connecticut has been quite as good if not better than the average of the past ten years." After detailed reports in regard to the health of towns, presenting many points of local interest and importance, Dr. D. A. Cleveland records some instructive cases illustrating the propagation of typhoid fever by polluted water. Prof. C. A. Lindsley, M.D., contributes a valuable account of the twelfth annual meeting of the American Public Health Association, and of the two national conferences of State Boards of Health, all of which he attended as a delegate. Reprints of the useful circulars put forth by the Board, entitled *Suggestions concerning Cholera*, *Instructions for Disinfection*, etc., are followed by a number of papers on miscellaneous subjects, among which may be mentioned an interesting article on *Glucose*, by Wm. H. Brewer, Ph.D., an elaborate paper by Arthur J. Wolff, M.D., on the *Park River Nuisance*, as affecting the sanitary condition of Hartford, which is illustrated by an excellent plate showing the various forms of bacteria according to Cohn's classification, borrowed from the *Monthly Microscopical Journal*, and two pages of reproductions of the author's micro-photographs, which leave much to be desired; a thoughtful essay on *Health and Religion*, by the Rev. Stewart Means; and a brief but useful paper by W. J. Sullivan, M.D.C.V.S., on *Hog Cholera*, in which proper precautions against the spread of this dangerous animal plague are urgently inculcated.

A registration report for 1883, contributed by the Bureau of Vital Statistics, concludes the volume, which altogether forms a useful addition to the valuable series of which it constitutes a part.

3. From the *Minnesota* Report we learn that the constant efforts which have been made for years to promote popular education in sanitary matters have borne good fruit, and that a greater number of active local boards of health are now in operation throughout the State than ever before, this increase being largely due to the augmented popular appreciation of their necessity. It is much to be regretted that complaint can be made of so few of the medical practitioners of Minnesota being competent to act as health officers, and the fact that such is the case forms one of the most powerful arguments adducible in favor of the efforts of the Illinois State Board of Health to enforce a higher standard of medical education, and particularly compulsory attendance upon a full course of instruction in hygiene. To meet this want as far as possible the Minnesota Board has secured a special examination, for such as choose to take it, by the medical faculty of the University, which, if successfully passed, entitles the candidate to the degree of "Licentiate in Sanitary Science." As a step towards the desideratum of thoroughly instructing every student in the great medical science of the future, preventive medicine, this excellent example might be profitably followed by every medical school in the country.

In regard to quarantine and the management of infectious diseases it is stated that twice in the period embraced in its report has the State Board been able to control outbreaks of smallpox beyond the power of the local authorities; and in every other outbreak it has found means to afford to the local boards of health such aid as to materially lighten and facilitate their work. As to diphtheria it has, with the aid of a few earnest health officers and physicians, succeeded after years of effort in making quarantine and disinfection trusted methods of control, and, as the reports indicate, with decided success.

A large part of the report is taken up with detailed accounts of the official action in outbreaks of smallpox and diphtheria. The number of distinct and separate epidemics of variola was seventeen—including 260 cases, of which 78 died. This large mortality is due to the fact that the table comprises thirty-five cases among the Indians, all of which proved fatal. The number of outbreaks of diphtheria recorded was thirty, the number of cases 274, and number of deaths in this series 75. Other reports on local epidemics of typhoid fever, scarlatina, glanders, and so forth, complete the volume, which is wisely devoted entirely to the work of the Board of Health, without being distended with voluminous essays and compilations, which frequently occupy much space without adding much to the value of similar publications. J. G. R.

Art. XXIX.—*Clinical Demonstrations on Ophthalmic Subjects.* By J. R. Wolfe, M.D., F.R.C.S.E., Senior Ophthalmic Surgeon to the Glasgow Ophthalmic Institution; Lecturer on Ophthalmic Medicine and Surgery in Anderson's College. Pp. 54. London: J. & A. Churchill, 1884.

This pamphlet consists of republications of four papers that have appeared in *The London Practitioner* and *The British Medical Journal.* The first is on "Transplantation of Conjunctiva from the Rabbit to the Human Subject," and gives the history of the operation since its introduction in 1875. Though the statistics are not so full and definite as could be wished, they show, at least, that the procedure is worth a trial in the desperate cases for which it is recommended. It is stated that the method has been practised successfully by Wecker, Becker, A. Græfe, and others, and that Dufour has performed the operation in four cases, with complete success in three. Dr. Noyes's cases number about a dozen, and he reports that "in no instance has he met with an entire failure, while the degree of benefit has been various." The author himself reports, in detail, three cases, in which the success attained may perhaps be considered exceptional, and states that he has operated in thirty-five cases, and that his "experience is that the operation proves highly satisfactory, considering the hopeless character of the cases we had to deal with."

The following is the author's description of the operation as performed in his recent cases:—

"The patient is put under chloroform, and also, at the same time, two rabbits; one being kept in reserve in case of accident. In this connection I may mention that I find the gray wild rabbit more suitable than either the white or the black; the conjunctiva in it is tougher and stronger, and stands handling better. I then separate the adhesions, so that the eyeball can move in every direction. I then, if necessary, enlarge the external palpebral opening of the rabbit so as to enable me to evert the lid better for dissection. Ligatures are then introduced into the conjunctiva of the rabbit to mark the extent of the membrane to be removed; by means of the ligatures it is put on the stretch and dissected with strabismus scissors. The membrane is spread out on the back of my hand and left to dry there while I finish the preparation of the part for its reception. The flap is cleaned and trimmed, after which it is slightly moistened, and then removed to its new site. It is now at once stitched to the free border of the lid, which is at the same time strongly everted, spread out carefully, and secured at the *cul-de-sac.* I generally find eight ligatures sufficient to keep the transplanted membrane in its place. The ligatures are left on for four or five days before they are removed."

The next paper is on "Transplantation of Skin-flaps from distant parts without Pedicle"—an operation introduced by the author nine or ten years ago, and known by his name. He usually takes the flap from the forearm, and insists particularly that it should be carefully freed from all areolar tissue. He prefers not to use sutures, but dissects up the edges of the wound, and inserts the margin of the flaps under them. He then covers it with several layers of lint wrung out in hot water and secures them with a bandage, which is not disturbed for three days. He is opposed to the use of carbolic acid or any other irritating application.

This procedure has now been adopted by a number of surgeons with a degree of success which, though very variable, is sufficient to give it a place among the established operations of ophthalmic surgery. An important point, not referred to by the author, and apparently not sufficiently brought out by others who have reported upon the subject, is the degree of subsequent contraction in successful cases.

The third article describes "An Operation for the Cure of Detachment of the Retina," which the author claims offers a fair prospect of success in properly selected cases. Von Græfe's operation of puncturing the retina with a needle, and allowing the fluid to escape into the vitreous, Bowman's modification of this by tearing the retina with two needles, and Wecker's attempt to drain off the effusion by means of a gold-wire seton in the sclerotic having been abandoned, the field may be considered an open one, and the hopeless character of the cases justifies the trial of any method that does not seriously endanger the little sight that may be left.

The operation recommended is as follows:—

> "The patient being put under chloroform and the speculum introduced, the assistant fixes the eyeball with forceps. A vertical slit is made with scissors into the conjunctiva and subconjunctival tissue, laying bare the sclerotic at a point corresponding to the detachment, which is generally below the equator at its anterior aspect.
>
> "The lips of the wound are separated by two small strabismus hooks, and the assistant steadily maintains the position of the eyeball to prevent the exposed portion of the sclerotic from shifting. The sclerotome is introduced in the sac formed by the fluid. The incision through the sclerotic is made obliquely in such a manner that the edges of the scleral wound should overlap each other and not remain gaping when the instrument is withdrawn. Gentle pressure is made upon the eyeball in the track of the receding lance by means of a fine spatula. The lips of the external wound are brought together with a fine silk suture or two, and both eyes are strapped with court-plaster. The patient is kept in bed in a dark room for three days. The plaster and ligature are removed on the sixth day, and the eye is gradually accustomed to light. On the eighth day the result of the operation may be tested."

This operation differs from that previously performed by A. Græfe and Hirschberg chiefly in baring the sclerotic before puncturing it, while these surgeons made the puncture directly through its coverings.

The fourth article is the report of a case of "Tubercle of the Iris and Ciliary Body," which the author justly considers a very rare disease, and states that this is the only case on record in Great Britain. He refers to seven cases reported by continental authors, and says that "the last on record is that reported by Rütter, June, 1880, from *Hirschberg's Clinique*." There are, however, two cases very fully and carefully recorded in the *Transactions of the American Ophthalmological Society* for 1883, by Drs. H. S. Schell and O. F. Wadsworth. G. C. H.

ART. XXX.—*A Treatise on the Science and Practice of Midwifery.* By W. S. PLAYFAIR, M.D., F.R.C.P., Professor of Obstetric Medicine in King's College, etc. Fourth American from the fifth English edition. *With notes and additions* by ROBERT P. HARRIS, M.D. 8vo. pp. 663. Philadelphia: Lea Brothers & Co.

A WORK that has passed through five English, and four American editions in nine years has by this reception had its value well established;

commendation cannot advance, criticism cannot retard its progress in professional favor. The last American edition of Playfair was dedicated to Dr. Thomas, but the honor of dedication of this issue is given Dr. Emmet.

In examining the new volume we find that some of the old illustrations have disappeared, and several new ones been introduced. The most important of the latter are four chromo-lithographs from Dr. Dalton's well-known paper in the *Transactions of the American Gynæcological Society*, and an excellent wood-cut of the female external sexual organs from Sappey: we have often wondered why English and American writers upon obstetrics have not hitherto sought illustrations from the latter source, a source which has furnished so many excellent ones to French obstetric authors. Some new temperature charts have also been added to the volume, as well as a wood-cut illustrating Bandl's theory of rupture of the uterus.

In the anatomical portion of the work we are still taught that the thyroid foramen is more triangular in the female, though this assertion so commonly made by writers upon anatomy and upon obstetrics, was disproved between thirty and forty years ago by the late Dr. John Neill, of Philadelphia, and more recently by Verneau. So too the labia majora still have mucous membrane upon their internal surface, and the nymphæ are folds of mucous membrane, though one finds the statements are erroneous if he will turn to Hart and Barbour's *Manual of Gynæcology*. But these are minor matters.

We observe on page 88 rather a singular change of a statement made by Dr. Harris in one of his editorial notes found on page 80 of the third American edition. In the latter Dr. Harris refers to three cases in which ladies living in the South, one in Louisiana, two in Florida, had profuse menstruation when living in the south, while this disorder was remedied by residence in Philadelphia. Dr. Playfair, after referring to English women in India suffering from profuse menstruation, says: "The same observation has been made with regard to American women residing in the Gulf States, who improve materially by removing to the Lake States." Pennsylvania is not usually classed among the Lake States.

In the chapter on *Conception and Generation* the term spermatozoa is retained, though physiologists are so generally and correctly replacing it by spermatozoids. So too it is taught that several of these so-called spermatozoa are necessary for impregnation, they disintegrate, and mingle with the yelk, a sort of spermatic infusion formed which imparts vitality to the ovule. But as far as the process of conception is known from actual study of it in some inferior existences, only the head of one spermatozoid is concerned in fructifying the ovule; from that head is developed the male pronucleus which combines with the female pronucleus, and thence the beginning of the new life.

Abdominal palpation has as in the previous edition, a single illlustration, and the text, about one page, is unaltered.

In considering the blood changes in pregnancy, Dr. Playfair states that the accurate observations of Willcocks have shown that the blood of pregnancy differs from that of chlorosis in this, that while in both the amount of hæmoglobin is lessened, in pregnancy the individual blood-cells are not impoverished as they are in chlorosis, but simply lessened in comparative number, owing to an increase in the water of the plasma, due to the progressive enlargement of the vascular area during gestation. We might add that recent observations in the pregnant goat, we believe, show that the size of the blood-cells is increased, and thus the diminution of hæmoglobin may be greater apparently than it is really.

Dr. Playfair asserts that the diagnosis of multiple pregnancy can only be made by auscultation. Quite in contrast with this statement is that made by Tarnier: "Of all the methods of investigation palpation is that which gives the best results in the diagnosis of twin pregnancy." It should be also remembered that Pinard by palpation was able to diagnose triplets.

Among the additions made in this edition by the author there is a paragraph devoted to the treatment of the cord by laceration. Dr. Playfair states that his friend Dr. Stephen has employed it for many years and in several hundred cases. "The cord is twisted round the index fingers of both hands and torn through, the lacerated vessels retracting without any hemorrhage." The author says that he himself has used it in many cases, but prefers the ligature.

Dr. Playfair advocates quinine in prolonged labor as an oxytoxic, and embodies in the text the conclusion of Dr. Albert H. Smith upon the subject, conclusions which were introduced in the third American edition by the editor. On the other hand, he questions the value of the faradic current in exciting or intensifying uterine action.

In the consideration of the diagnosis of placenta prævia the following paragraph is still retained: "Dr. Wallace has suggested that vaginal auscultation may be serviceable in diagnosis, and states that by means of a curved wooden stethoscope the placental bruit may be heard with startling distinctness. This is, however, a manœuvre that can hardly be generally carried out in actual practice." As there is no placental bruit, for Dr. Playfair himself says, p. 156, "The non-placental origin of the sound is sufficiently demonstrated by the fact that it may be heard for a considerable time after the expulsion of the placenta," one may be excused from seeking it even by vaginal auscultation. In the chapter upon rupture of the uterus the illustration from Bandl previously mentioned is found; it shows the dangerous thinning of the lower uterine segment which occurs in protracted labor when nature is unable to overcome the resistance, a thinning which precedes rupture in such case—an accident which is, as so happily expressed by Hart, a tension tear.

In the chapter upon *Transfuion* the most important change is the addition of a very full description of Schäfer's method of immediate transfusion. The chapter upon the *Puerperal State* has a list of rules which Dr. Playfair states he has been in the habit recently of distributing to monthly nurses having charge of his patients, and he believes that there have resulted for the latter a marked improvement in comfort, and a more generally satisfactory convalescence. One of the directions, by the way, is to twice a day syringe the puerpera's vagina with a warm solution of carbolic acid, 1 in 20.

In the chapter devoted to *Puerperal Septicæmia*, Dr. Playfair still holds to the autogenetic origin of the disease in some case. Probably this is the view accepted by the majority of physicians, and yet we cannot help believing that with increase of knowledge the doctrine of self-infection will be rejected, for it does not seem rational that the individual can have created within her precisely the same disease which is recognized in the majority of cases as coming from an external cause. Supposing the disease to depend upon germs, the puerpera furnishes in decomposing clot or placental fragment a nidus for the development of these germs, which always come from the outside, and then they enter veins or lymphatics through the gateways furnished by wounded tissues. An appeal to autogenesis in a case of puerperal septicæmia is simply a confession that we do not know how the infection came from the exterior, and, therefore, it must have been self-developed. Autogenesis is fatalism, iron necessity, the negation of protective means, the paralysis of medical art.

In considering the channels through which the septic matter may be absorbed, Dr. Playfair suggests that it may enter through the unbroken mucous membrane of the vagina or of the cervix, stating that this hypothesis might serve to account "for the occasional, though rare, cases in which symptoms of the disease develop themselves before delivery, or so soon after it as to show that the infection preceded labor." But would not pulmonary absorption be quite as probable an hypothesis to explain these exceedingly rare, if not doubtful cases?

Many of the additions to the volume have been taken from the notes which Dr. Harris made in the previous edition; but several are derived from other sources. Dr. Playfair seems to have revised the volume carefully, so that it still is one of the best obstetric manuals in the English language.

The American editor has made several additions, some of these appearing in the text, others as foot notes. Among the most notable of these additions are those relating to the Cæsarean operation, and that upon the revival of symphyseotomy in Italy. Of course the latest, fullest statistics relating to gastro-hysterotomy are given. Dr. Harris is indefatigable in research, and his authority in all that pertains to cases of this operation is everywhere recognized. He has one foot-note, however, p. 618, which we believe will be disapproved oftener than endorsed: "I believe that the entire abandonment of venesection has been a grave error," etc. This relates to the treatment of puerperal septicæmia. Contrast this opinion with the words of Siredey, one of the best of recent authorities upon puerperal diseases. "Among the antiphlogistics general bleeding is abandoned. Without demonstrated efficacy upon the progress of the phlegmasia, without action upon the local pain, it has for its most certain result to increase without any advantage the feebleness of the patients, when it is of the highest importance to preserve their forces so that they may resist a protracted malady, one which always presents a certain degree of septicity." We might add to this objection that, bleeding will facilitate absorption of fresh infectious matter, or may produce disturbance of thromboses that in some degree localize the poison, such disturbance leading to its general diffusion through the system, and therefore should be rejected in the treatment of puerperal septicæmia. T. P.

ART. XXXI.—*Atlas of Female Pelvic Anatomy.* By D. BERRY HART, M.D., F.R.C.P.E., Lecturer on Midwifery, School of Medicine, Edinburgh. 4to. pp. 89. New York: D. Appleton & Co., 1884.

THIS is a handsome quarto of eighty-nine pages, and contains thirty-seven plates, and a few wood-cuts. Many of the illustrations are original, others are copies of those not generally familiar to the profession. It is divided into six sections as follows: 1. Descriptive. 2. Dissectional. 3. Sectional and topographical. 4. Structural and genu-pectoral anatomy. 5. Cervical canal in pregnancy and parturition. And 6. Microscopical anatomy. Finally there is an appendix occupied with "some points in the physics of the bladder and rectum," and the "etiology of flexions."

When we state that this work is a monument of patient research and of original investigation worthy the Edinburgh School, we do no more than simple justice. It is impossible to describe or criticize plates without having them presented to the readers, and therefore the attempt will not be made. That the work will be eagerly and profitably consulted by obstetric and gynæcological students we do not doubt.

The only criticism that can be made upon the text is that it is too scanty—fuller descriptions of several of the illustrations would make the work more useful, indeed we would be willing to have fewer plates and more text.

ART. XXXII.—*Holden's Anatomy, a Manual of Dissection of the Human Body.* By LUTHER HOLDEN. Fifth edition, edited by JOHN LANGTON. 8vo. pp. xx. 886. Philadelphia: P. Blakiston, Son & Co., 1885.

MR. HOLDEN has done good service in anatomy both by his *Manual of Dissections* and his *Surgical Landmarks.* The appearance of a fifth edition of his present work is of itself no small compliment. Its beautiful illustrations, large readable type, brief but clear descriptions, all have combined to give it an assured place in anatomical literature. Wisely we think in a Manual of Dissections he omits all description of the bones, as such knowledge should be presupposed in a student who is far enough advanced to begin dissecting. The ordinary directions for dissecting and the description of what will be seen is well though rather briefly supplemented by practical remarks upon the surgical applications of the knowledge so acquired.

Mr. Langton, the editor, has had but little to do, and it has been chiefly in some rearrangement of the order of dissection and in adding some illustrations and text, especially as to the nervous system and organs of sense. We can commend the book very warmly to our readers as one of the best we know for its purpose. W. W. K.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

Electrization of the Excito-Motor Regions of the Brain.

M. VULPIAN, at a recent meeting of the French Academy of Sciences, reported the results of his experiments in electrization of the excito-motor regions of the brain. He found that—

1. Electrization of the subcortical white substance of the brain of a dog, the gray matter of which was frozen with chloride of methyl to a depth of two-fifths of an inch, caused violent attacks of epilepsy—thus determining the effect of electricity upon the brain when its gray matter is not called into action.

2. The epileptiform attacks—provoked by electrization in animals previously chloralized by intravenous injection are characterized by modification in the movement of the heart—and of respiration—by oculo-pupillary phenomena, and by rhythmic chorea of certain muscles of the face.

3. Epileptic attacks caused by faradization of the excito-motor regions of the brain determine an increase of rectal temperature when they cause convulsions of the muscles of animal life (in dogs curarized or chloralized). The generalized vaso-constrictor effects in curarized animals, the transient weakening of the heart in animals chloralyzed during the attacks, probably, also, the diminution of the activity in the physico-chemical phenomena of nutrition, appear to be the principal causes of the reduction of temperature.

4. As to the duration of excitability after death—the experiments of M. Vulpian confirm all those of other investigators, which prove that in the higher mammals under ordinary conditions, the substance of the brain proper loses its motor excitability as soon as the circulation has completely ceased.—*Revue Médicale*, May 9, 1885.

MATERIA MEDICA AND THERAPEUTICS.

The Physiological and Therapeutic Action of Antipyrin.

Dr. LÉON ARDUIN, after much experimental study, has arrived at the following conclusions relative to the physiological and therapeutic effects of antipyrin:—

Of its physiological action he says:—

1. Antipyrin, without doubt, influences the nervous system; its action is expended upon the medulla oblongata and cerebrum.

2. Its action upon the circulation is to diminish the force of the heart-beat; animals die of paralysis of the heart. From spectroscopic examination of the blood the drug does not seem to have any special effect upon this fluid. According to Professor Demme it is a poison to the protoplasm. As to the influence of antipyrin upon arterial tension there is a great divergence of opinion; some holding that it is elevated, others that it is lowered. Queirolo, who has made special study of the action of the drug upon the bloodvessels of the skin, has constantly noticed that they become dilated, and by this effect it is, according to him, that antipyrin reduces temperature.

3. Antipyrin seems to have no great influence upon respiration, nevertheless it is admitted, in a general way, that the respiratory movements are diminished in frequency.

4. The action of antipyrin upon urinary secretion is, in many respects, still obscure. It is admitted, however, as demonstrated by Müller, that the urine is diminished to a very limited extent; the sulphates increased; while the urea is at the same time increased.

5. As to its hæmostatic effect no explanation at present can be given, and it must suffice simply to remark such action.

6. How does antipyrin reduce temperature? The hypothesis that this special action of the drug is produced by the evaporation of the perspiration must be discarded, and in opposition to Queirolo, who explains this effect by the action upon the general circulation, or simply by its effect upon the vessels of the skin. Dr. Arduin inclines to the opinion that the reduction of temperature is the result of a direct action of the drug upon the *thermogenic centres*, and holds that in no other way can its prompt and certain apyretic effect be explained.

The therapeutic application of the drug is stated as follows:—

1. In all febrile diseases—not the simple fever, but the exaggeration of the fever, *i. e.*, hyperpyresis—varying in each patient, is the indication for the use of apyretic medication.

2. In the severer febrile diseases, such as typhoid fever, in tubercular patients, in pulmonary phthisis, the persistence of the fever constitutes a new indication.

3. To avoid the production of excessive and exhausting perspiration, and to avoid reducing the patient to a condition of adynamia, which may result from abuse of the drug, it should be administered in small doses.

Finally, in apyretic medication, only a physiological and clinical result should be sought, that is, no effort should be made to produce a normal temperature in a disease, of which pyrexia is a special characteristic.

The drug may be administered per rectum by injection or suppository.

In the latter form it is not efficacious, as an antipyretic, but of great service in some cases of hemorrhoidal flux. The most desirable method of administration, however, is by mouth.

The antipyrin should be dissolved in a little sweetened water flavored with aqua menth. pip. or other aromatic, with which a little red wine may be advantageously incorporated.

The dose is from 8 to 12 grains in phthisis; 15 to 45 grains in typhoid fever, and other diseases in which great elevation of temperature is characteristic. No more than 15 grains should be given at a time, and the doses should be at intervals of about one hour.—*Bulletin Général de Thérapeutique*, March 30, 1885.

Dr. **PUSINELLI** summarizes the results of his investigations upon the therapeutic effects of antipyrin as follows:—

1. Antipyrin operates in all cases, with the single exception of rheumatism, as a safe means of lowering the temperature.

2. The duration of the time through which the antipyretic effect extends, depends upon the condition of the disease and upon the size of the dose. Fifteen grains produce marked effect in severe febrile diseases for a period of two or three hours; thirty grains for from four to five hours; and forty-five grains for about six hours.

3. Before the treatment with antipyrin is begun, test doses of the drug should be administered, of a strength varying from seven and a half to fifteen grains, in order to note the strength of individual doses.

4. In severe febrile diseases, as in typhoid fever, croupous pneumonia, erysipelas, etc., in which the temperature is very high, doses of thirty grains for men and of fifteen grains to women are indicated, and then only at intervals of an hour, and if the remedy can be endured in doses of this size.

In private practice its administration every two or three hours is advisable.

For complete defervescence from sixty to ninety grains daily suffice.

5. In diseases with a temperature but little above normal, and in chronic diseases, especially in phthisis with hectic fever, it is often necessary only to give a single dose of from fifteen to thirty grains, in order to obtain relief from the fever of from six to twelve hours, and even for a longer period.

6. Against the febrile manifestations of acute articular rheumatism, the remedy is sometimes contraindicated. Operation upon the joint disease was not observed.

7. In intermittent fever antipyrin is without effect; it sometimes is serviceable in cutting short the duration of the fever at its highest point at the time of its occurrence.

8. In no case of disease treated with antipyrin did it exercise a specific effect, for example, as does quinine in intermittent fever. However, the course of typhoid fever under treatment with antipyrin is perhaps shorter and milder. In croupous pneumonia there is marked improvement of the general conditions under its use without any effect being produced upon the local process of the disease in the lungs. Further, in phthisis with severe remittent fever, freedom from fever of several days' duration, with improvement of the general symptoms, is frequently manifested.

9. Antipyrin, generally speaking, is well borne. Collapse and chills were never noticed; pulse and respiration were not unfavorably influenced, and upon the kidneys no unfavorable effect was observed.

10. Unfavorable symptoms, due to an exanthem, occasionally were manifested, as sometimes were vomiting and perspiration. The vomiting was especially noticeable in women, rarely in men. To avoid the symptoms of vomiting, administration of the drug by enemata may be resorted to; but even then the symptom sometimes is observed. The perspiration is only seldom disagreeable and harmful to the patient, and it then may be obviated by the contemporaneous administration of atropia.

11. Antipyrin has the great advantage over quinine of being easily soluble in water, and further, it is of itself capable of reducing the temperature so that for a long time a perfectly normal, bodily temperature is obtained, and this quinine is unable to accomplish.

12. Antipyrin is to be preferred to kairin and hydro-chinin on account of its persistent effect upon the fever, and further, on account of the absence of collapse and chills during its use.—*Deutsche Med. Wochenschr.*, March 12, 1885.

Terpine and Terpinol.

In a study of the effects of terpine and terpinol, Dr. G. GUELPA reaches the following conclusions:—

a. Terpine even in very large doses has no action upon the respiratory system.

b. Terpine in doses of less than 30 or 45 grains has no effect above the genito-urinary functions. In larger doses it does not cause albuminuria or hæmaturia, but perhaps a more abundant production of the phosphates, due probably to the impediment to digestion to which it gives rise.

c. Moderate doses of terpine (less than 30 or 45 grains), do not affect the nervous system. In larger quantity it produces meteorism. To cause fatal results the drug must be given in doses of 30 grains for about every two pounds in weight of the animal.

d. Upon the digestive tract terpine produces no other effect than that of a substance very slightly assimilable and heavy upon the stomach.

Terpinol.—Experiments show that—

a. Terpinol like terpine is a drug, entirely safe of administration even in very large doses. Animals, such as the hare, support without inconvenience 38 grains administered within twelve hours.

b. It has little or no action upon the genito-urinary organs.

c. It is eliminated very promptly and almost entirely through the respiratory tract, and hence is useful as a remedy in catarrhal disease of the bronchi, on account of its favorable action upon the bronchial secretion.—*Bulletin Général de Thérapeutique*, April 30, 1885.

Studies on the Properties and Physiological Action of Boldo.

Dr. LABORDE gives the following account of his investigations upon Boldo:—

1. Boldo, by one of its principles which seems to have the chemical characteristics of a *glucoside*, produces primarily, by its effect upon the central nervous system, a hypnotic effect, causing sleep with suspension of all functions and relations of conscious life.

2. This predominant effect is accompanied to a certain extent by general anæsthesia and dulling of the special senses, notably that of audition, and by abolition of the oculo-palpebral reflex.

3. The condition of slumber is preceded and accompanied by a state of motor incoördination analogous to that produced by alcoholic intoxication. This condition is especially noticed after doses which are almost toxic.

4. The effect of the glucoside of Boldo upon the functions of respiration and circulation that follows immediately its hypnotic action. It calms and regulates the respiratory efforts and the pulsations of the heart, reducing their number also, so as to produce, in toxic and mortal doses, progressive arrest of function, which is first manifested in the respiratory system. The result is probably due to an extension of the effect of the drug to bulbar respiratory centre.

5. Lowering of temperature, in a slight degree, is also observed as one of the results of the general and physiological action of Boldo.

6. It has a stimulating effect upon the various secretions, especially upon those of the liver and kidneys, by which it appears to be eliminated. The elimination by the urine is readily revealed by its characteristic aromatic odor, which is developed by boiling in the presence of a few drops of sulphuric acid, and by the addition of an alkali (soda or potassa).

7. The physiological effects of the glucoside are manifested in like manner, but in different degrees, according to the mode by which the drug is administered,

and the consequent variation in the speed with which it is absorbed, as is shown by intra-venous and subcutaneous injection and stomachic injection.

8. Administration by the stomach may cause nausea and vomiting, but a dose capable of producing sleep is not necessarily emetic in its effects.

9. Deadly toxic effects, which result from very large doses, 7 to 10 grains for an Indian pig of a weight of 9 to 14 ounces, and of ʒiiss to ℥ss for a dog of 18 to 24 pounds, are first manifested by primary and progressive suspension of respiration in the midst of quiet and uninterrupted sleep, without apparent reaction of any sort, and notably without convulsions.

10. The moderate toxic effect of the glucoside appears to result from its separation from the alkaloid which apparently coexists with it in the plant; inasmuch as experiments with the latter prove that it is essentially toxic and convulsive in its nature.

The therapeutics of the glucoside of Boldo, as indicated by experimental study, are predominantly *hypnotic*, and its use is indicated in those conditions where insomnia is to be combated, and it is desirable to obtain tranquil sleep. The drug, under such circumstances, presents marked advantages over the other hypnotics, especially over opium, in that it does not involve risk of establishing any condition analogous to the opium habit. Though the dose is large, the almost entire absence of toxic effect enables it to be given in large quantities without fear of bad results. It may be administered in doses of 15 grains, at intervals, until four or five doses or even more are taken. It is not only indicated in insomnia, but in cases where it is desired to regulate or re-establish certain secretions, notably those of the liver, kidneys, or salivary glands.—*Revue de Thérapeutique*, April 15, 1885.

The Effect of Subcutaneous Blood Injection and the Injection of Pure Hæmoglobin upon the Proportion of Hæmoglobin in the Blood of the Anæmic.

Dr. Dionys Benczór, in a series of studies to determine the effect of blood and hæmoglobin, introduced into the system, upon the proportion of hæmoglobin in the blood in chlorosis and anæmia, reaches the following conclusions as to the effect of the subcutaneous injection of blood and of pure hæmaglobin in anæmia:—

1. Crystallized hæmoglobin held in solution, when injected beneath the skin, is readily taken up by the circulating blood, and a small proportion of the hæmoglobin is again excreted by the kidneys.

2. The hæmoglobinuria thus existing is not real hæmoglobinuria; nevertheless blood-corpuscles and cylinders are present in the blood to a moderate extent.

3. During the excretion of hæmoglobin, fever and albuminuria are observed. The albuminuria is of longer duration than the hæmoglobinuria.

4. Crystallized hæmoglobin, when dissolved and injected beneath the skin, produces pain and inflammation.

5. Defibrinated human blood when subcutaneously injected with necessary care, even in great quantity, causes neither pain nor inflammation if its introduction into the general current is aided by massage.

6. The blood of animals introduced beneath the skin in the same amount almost always leads to the formation of abscesses.

7. The subcutaneous introduction of blood increases the quantity of hæmoglobin contained in the blood. The increase is most marked the day following the injection, but is recognizable ten days after the operation, although to a moderate degree. By repeated injection the proportion of hæmoglobin becomes permanently increased.

8. To determine quantitatively the amount of hæmoglobin in urine containing blood, it is recommended to convert the hæmoglobin and the remaining coloring matters of the blood into acid hæmatin, by coagulation of the coexisting albumen by boiling, and to estimate the amount of acid hæmatin by spectrum analysis, and from this estimate to determine the proportion of hæmaglobin.—*Deutsches Archiv für Klin. Med.*, April, 1885.

MEDICINE.

Treatment of Cholera during the Algid Period.

Dr. **GEORGES RIGOLETTI** attributes the principal symptoms of the algid period of cholera, such as lowering of the temperature of the exterior of the body, cyanosis, change of countenance, inextinguishable thirst, difficulty of respiration, epigastric constriction, hiccough, vomiting, muscular cramp, prostration, general collapse, and paralysis of the heart, to a lack of the normal proportion of water in the blood. Two indications correspond with the symptomatology:—

1. To restore to the tissues their normal water, and to the blood its normal serum, in order that it may perform its functions.

2. To excite the nervous force and to stimulate the heart. To fulfil these indications Dr. Rigoletti proposes the hot bath, containing ammonia and wood ashes.

The bath is prepared with water of a temperature ranging from 100.4° F. to 104° F.; about one quart of aqua ammonia and a sufficient quantity of wood ashes. The duration of the bath is from fifteen to twenty-five minutes, and it may be renewed in the same day, and for many days in succession, according to the case. To avoid the ammoniacal vapors, the patient is so covered as to prevent their reaching the head. The patient, on being removed from the bath, is covered with warm blankets, which favor and maintain reaction. Frictions with camphorated alcohol are also to be practised, and aromatic infusion of chamomile and spirits are to be administered. If the reaction come on too violently, it is to be moderated by ordinary measures. The efficacy of the bath is more prompt when the algid state is least advanced. The method was used in 1884 with much success in the epidemic at Naples, and the official report as to its value is as follows:—

1. The hot alkaline bath administered at the beginning of the algid period stimulates the peripheral circulation and increases the power of reaction.

2. The nervous forces are strengthened; the patient is so much relieved that many times during the day he requests the bath; the constriction of the epigastrium diminishes and disappears.

3. The pulse, often imperceptible, is gradually strengthened; the features become more natural, and the face even sometimes becomes flushed. Anuria almost always ceases in the bath.

4. Diarrhœa continues, but the vomiting and hiccough disappear with the administration of the bath.

5. The ammoniacal vapors excite cough and interfere with respiration, and for this reason it is necessary to protect the patient from them. However, the effect of the vapors is beneficial in that they increase the power of the voice, and render it less rough and more intelligible. In conclusion, the hot alkaline bath is a powerful therapeutic agent in the algid period of cholera, and its effects are most constant.

Dr. Rigoletti concludes his paper by stating that reaction, under treatment with the bath, is always *prompt*, occurring within twenty-five minutes; *complete*, as shown by the disappearance of all algid symptoms, and *constant*, having never failed in twenty-three cases in which the algid condition was treated by its use. He considers it the remedy, *par excellence*, for the period of the disease, and much superior to the intra-venous injections of salt water proposed by Dr. Hayem and to the subcutaneous alkaline injections of hot water suggested by Prof. Cantani.—*Journal de Médecine de Paris*, May 10, 1885.

Epilepsy as related to the Motor Zones of the Brain.

Prof. **Fenoglio**, after observing a case of epilepsy in which a lesion of the right motor zone of the brain existed, and in which the operation of trephining was resorted to, reaches the following conclusions as to the relations of epilepsy with lesions *observed*:—

1. That the so-called motor zone in man may be considered as the epilepsy-exciting region.
2. Irritation of this zone, even when covered by the meninges, may give rise to an arrest of the radial pulse of the opposite side by an action upon the centres of the vagus.
3. Pressure, though light, upon this zone may produce a series of epileptic seizures. The condition resembles the epileptic state without, however, any rise of temperature.
4. Compression of the motor zone does not give rise to any disturbances of sensibility on the opposite side.
5. The position of the cicatrix and the persistent contraction of the arm show this centre to be about the middle of the central convolution.
6. The lesion of the arm centre may cause irritation of the neighboring centres, by which spasmodic manifestations may be presented in muscles whose innervation arises near these centres.
7. Light pressure in the motor zone may give rise to a marked change in disposition.—*Lo Sperimentale*, Dec. 1884.

Progressive Muscular Atrophy. Myopathy without Neuropathy beginning commonly during Infancy in the Muscles of the Face.

Drs. L. **Landouzy** and J. **Dejeune**, in the *Revue de Médecine* for April, 1885, complete a careful study of the above disease.

Their conclusions are based on the careful observation and study of a great number of cases, and afford the latest authoritative expressions concerning the nature of the affection under consideration.

Their conclusions embrace and are based upon personal observations of the disease as relates to heredity, upon autopsies held upon those affected with progressive muscular atrophy, and upon critical research during the course of their investigations and are stated as follows:—

1. The affection described by Duchenne, under the name of the progressive muscular atrophy of children, and which, up to the present time, has been regarded as being of the same nature as progressive muscular atrophy of spinal origin in the adult, appears as a disease entirely distinct, and has with the last affection a relation purely symptomatic.
2. Although progressive muscular atrophy of the adult (type Aran-Duchenne) is the result of a spinal lesion, the progressive muscular atrophy of infancy is evolved from its beginning to its end without participation of the nervous system,

cerebral or peripheral, and is therefore due to a process primitively and exclusively *myopathic*, and is therefore to be completely separated from progressive muscular atrophy of the adult, which is essentially of spinal origin. The disease as manifested is children in *myopathic*, in adults it is *myelopathic*.

3. Progressive atrophic myopathy constitutes, from a clinical point of view, as well as from an anatomical standpoint, an entirely distinct disease in the domain of primary pathological muscular atrophies, both in its etiology, pathogeny, symptoms, and evolution.

4. Progressive atrophic myopathy (the facio-scapulo-humeral type) most frequently begins during infancy in the muscles of the face (muscles of expression). Nevertheless it may appear in youth, adult age, or in advanced life.

5. When it begins in infancy it most commonly attacks first the muscles of the face, orbicular, labial, and palpebral, and as a result the physiognomy of the patient is most peculiar, and while in repose or during excitement the immobility of the features contrasts remarkably with the animation shown by the eyes.

6. When, in an infant already affected with atrophy of the superior and inferior facial muscles, the affection tends to become general; such generalization is first manifested almost always in the muscles of the upper limbs, and predominates especially in the muscles of the shoulders, and is distinguished by a special topography (*type, facio-scapulo-humeral*).

7. The atrophy attacks the muscles in a manner entirely peculiar, and there are found in a group of muscles innervated by a special nerve, singly and entirely, muscles in normal condition in the midst of others more or less completely destroyed. The muscles which remain intact almost indefinitely, are, in particular, the *sub-* and *supra-spinous*, the *sub-scapular*, and the *flexor* group of the hand and fingers.

8. The allied muscles are, from the beginning of the affection, atrophied; never present any appearance of hypertrophy; and the same is true of those muscles which escape atrophy.

9. Muscles of special function—sight, mastication, deglutition, phonation—remain intact during the whole period of the disease; the same is true of the muscles of respiration.

10. The consistence of the muscle presents no special peculiarity.

11. With all patients the fibrillar contractions are entirely in default, and the idio-muscular contraction is absent or exceedingly diminished and difficult of confirmation.

12. Electrical contractility (faradic and galvanic) is modified quantitatively. There is simple diminution without inversion of the normal formula, and therefore without the reaction of degeneration.

13. Generally, the tendon reflexes do not disappear even when the muscles are exceedingly atrophied. In certain cases, however, they may disappear very early in the disease.

14. General and special sensibility, the nutrition of the skin, the cutaneous reflexes, and the power of the sphincters, are conserved during the whole course of the disease.

15. Progressive muscular atrophy of adolescence or of adult life, more rarely observed than the affection of childhood, does not always first attack the muscles of the face. The disease may begin in the upper limbs, and very rarely in the lower limbs. The face is attacked consecutively or remains intact, and either the facio-scapulo-humeral, the scapulo-humeral only, or the femoro-tibial type may be observed.

16. The evolution of progressive atrophic myopathy is of slow development.

17. Its anatomical lesion consists of an atrophic myostitis, with moderate sclerosis without any appearance of muscular hypertrophy, and is the type of a simple and purely idiopathic atrophy, proceeding from which as a basis, nosography will be improved by characterizing and distinguishing the diseases under discussion as *myopathic* and *myelopathic*.

18. The diagnosis of the progressive atrophic myopathy, which progressive spinal atrophy (type, Aran-Duchenne of Charcot, and type scapulo-humeral of Vulpian) places among the diseases of the last type (myelopathic).

The face is attacked (type, facio-scapulo-humeral) or is intact (type, scapulo-humeral). When a patient is attacked with the disease of a facio-scapulo-humeral type the differential diagnosis rests upon the following considerations: In myelopathic muscular atrophy the face is *never* attacked; in progressive muscular atrophy beginning in infancy the face is *always* attacked. The atrophy of the muscles of the face is the only clinical characteristic which permits a decision as to the origin of the disease. Its value is absolute.

Further points of diagnosis are based upon the indefinite conservation of certain muscles, the absence of fibrillar contractions, *the retraction of certain muscles*, the absence of the reaction of degeneration, the conservation of the tendon reflexes, the slowness of the evolution of the disease, heredity, direct or collateral. Considerations of the same order are applicable to the differential diagnosis from lateral amyotrophic sclerosis, which, by its principal characteristics, bulbar paralysis, contractures, paralysis more extensive than atrophy, etc., will be easily distinguished.

19. Atrophic myopathy is distinguished from pseudo-hypertrophic paralysis by the following characteristics:—

A. In atrophic myopathy it is the rule that the face participates in the atrophy.

B. In pseudo-hypertrophic paralysis there always exists a hypertrophic condition of some muscles; in atrophic myopathy there is no muscular hypertrophy.

Finally, pseudo-hypertrophic paralysis is a disease of early infancy, much more common in males, and the patient rarely passes the twentieth year. In progressive muscular atrophy the disease is of later origin, may appear indeed at any time of life; the sexes are attacked indifferently, and its duration is indefinite.

20. Atrophic myopathy is distinguished from the infantile variety of Erb by the participation of the face in the atrophy, the absence of pseudo-hypertrophy, and the frequency, if not the constancy of heredity, either direct or collateral.

The prognosis of progressive atrophic myopathy is grave, inasmuch as the disease seems never to be arrested in its progress. Two circumstances diminish the gravity thereof—its slow progress, and the constant integrity of special muscular apparatus (mastication, respiration, etc.).

21. The pathology of the disease is unknown, heredity, direct or collateral, being the only recognized etiological factor.

22. The treatment is tentative only, and consists of general tonic treatment, together with the application of electricity.

23. Data as to the frequency of the disease are wanting, but its existence beyond doubt has been frequently overlooked on account of its having been insufficiently studied and incompletely described.

24. The special physiognomy noticed in the disease deserves recognition and mention as the *facies myopathique*.

A Case of Ischæmic Muscular Paralysis and Contracture, in Connection with Loss of Sensibility.

Dr. C. **Sonnenkalb** reports an interesting case of ischæmic muscular paralysis and contracture in connection with loss of sensibility. The patient was a very strong and well-developed healthy laborer, about twenty-five years of age. September 5, 1884, he, while at work, suffered a subcutaneous fracture of the middle of the humerus. The same day the arm was put in splints and the forearm surrounded with simple bandages to the wrist-joint. A short time after the application of the bandage extensive swelling of the hand supervened, associated with a feeling of numbness, but without severe pain. (The patient exhibited, moreover, little sensibility to the existence of pain.) The hand hung down, but when paralysis first appeared the patient was unable to say, as he intentionally had abstained from attempting to move the member. According to the statement of the patient, the following day the bandage was removed from the forearm. The hand was much swollen, and the bandage around the wrist had deeply furrowed that portion of the arm. Upon the skin of the forearm vesicles were formed. The contents of these were serous in nature, and the muscles of the forearm were hard and firm as wood. In eight days the bandage was removed from the upper arm and replaced by a new one. In all the splint was applied three weeks. The sensibility of the arm had so diminished from the beginning that the patient, nine weeks subsequent to the reception of the injury, burned the skin upon the dorsum of the hand without experiencing the least pain. The patient, up to the time of his entrance into the hospital, had been treated with electricity.

Examination of the arm, Dec. 3, 1884, revealed a united oblique fracture in the middle of the left humerus. The fragments were but little displaced; motion of the arm was good; and there was but little thickening at the seat of fracture. Mobility of the shoulder and elbow-joints was normal. The muscles of the forearm, especially the flexors arising from the internal condyle, were stone-hard. The forearm was fixed midway between pronation and supination, and the hand was flexed at an angle of 150° with the humerus. The first phalanges of the fingers were hyper-extended; the second and third phalanges were flexed. The hand was thus perfectly fixed in this claw-like position. When efforts at extension were made the tendons in the hollow of the hand became very prominent, and the distal phalanges of the fingers were correspondingly flexed, and efforts to straighten the fingers were accompanied by compensatory flexing of the hand. It was, therefore, evident that the flexor muscles had not only lost their elasticity, but, also, that they were shortened. The sensibility of the forearm, as far as the bandage extended, was perfectly maintained, but beyond was entirely lost. The loss of sensibility equally affected all the nerves supplying the hand, and showed that the origin of the lesion was not the original fracture—for example, pressure upon the ulnar nerve at the elbow, and also below it, was plainly perceived in the fingers. The faradic current, of a strength almost unendurable to the sound arm, though perceptible as far as the hand, produced no muscular contraction. After a month's treatment the sensibility had returned in the hand as far as the fingers, although much trophic destruction was evidently present, since, after daily warm baths, which were easily borne by the normal arm, vesicles were produced on the paralyzed hand. In addition to the baths and electrical treatment, the hand was daily treated for a few minutes with a splint and elastic bandage, with the view to overcome the existing contraction. After further treatment of about six weeks, the sensibility had entirely returned to the hand, and the joints were perfectly mobile. The condition of the muscles was much improved, as related to their unnaturally hard condition, but contraction persisted, with manifestation of but the slightest improvement.—*Deutsche Med. Wochenschr.*, April 23, 1885.

Treatment of the so-called Catarrhal Erosions of the Posterior Wall of the Larynx.

Dr. Théodore Hering, in a contribution to the study of catarrhal erosions of the larynx and their relations with tuberculosis, after discussing their pathology, complications, and consequences, makes the following suggestions as to treatment:—

1. In the treatment there are two indications to fulfil: (1) to remove every irritating cause; and (2) to accelerate the cure of the ulcerations.

The first of these indications is the more important, and if neglected all local treatment will be useless. All causes of irritation of the larynx and pharynx, and anything which has a tendency to provoke cough, should be removed. In this catalogue are included catarrhal affections of the pharynx and of the nose, which have always an irritating effect upon the larynx. It is also necessary to avoid impure air, heat, cold, and to abstain from smoking and snuffing. The patient should also talk as little as possible, and remain in a room, the temperature of which is equable, and maintained at 68° F., such conditions being favorable to cure.

The dryness of the pharynx and larynx may be diminished by inhalations of the vapor of warm water, and by atomized applications of weak solutions of carbonate of soda, chloride of ammonia, and bromide of soda and potash. Very hot vapors and astringents are not always well supported, and occasion congestion of the larynx and violent coughing which are harmful. Narcotics are positively indicated when the cough is violent and fatiguing, as this occasions a recrudescence of inflammation which retards cure. Mineral waters, such as Ems and Vichey, frequently are useful in the treatment of the disease. The local treatment recommended by many specialists does not always seem efficacious. It appears that the erosions of the mucous membrane of the larynx do not present the character of active hyperæmia, but that they are more frequently produced by disorders of nutrition, and hence Dr. Hering considers that rest of the diseased part is of the first importance. Even the most gentle bathing, or the most delicate insufflations always irritate the altered mucous membrane, provoke cough, and thus occasion instant hyperæmia. The application of a solution of tannin by the Stœrck brush, so much in vogue, is only harmful. Besides, the discharge being very small in these patients, cleansing by the brush excites and irritates the larynx, and expectorants even more readily have the same effect. For this reason it is plain that such applications should be no longer recommended. Local applications are only indicated when, after cicatrization of the ulcers, catarrh of the larynx still persists, and even under such conditions, such applications should be employed with the greatest care, and be varied according to the particular case presented. Dr. Hering has for this purpose obtained very satisfactory results from the use of nitrate of silver, and of sulphate of zinc, applied every two days. The general treatment consists in the use of leeches in the beginning, or of blisters in the region of the larynx, which in rebellious cases add much to the relief and comfort of the patient.—*Revue Mensuelle de Laryngologie, d'Otologie et de Rhinologie*, May, 1885.

Pulmonary Tuberculosis in Families.

At a meeting of the French Academy of Medicine held April 14, 1885, M. Leudet read an interesting paper upon pulmonary tuberculosis in families. As a physician of wide experience and long practice his opinions and observations are worthy of due consideration.

The following are the principal conclusions reached in his paper:—

1. Acquired tuberculosis attacks by preference those individuals suffering from congenital debility or from effects of previous disease. Pneumonia and bronchitis do not predispose the patient in an unusual degree to the disease. Persons in families free from tuberculosis succumb most frequently at an advanced age from diseases foreign to the respiratory system.

2. The hereditary transmission of syphilis exists in more than one-half the cases. Hereditary transmission is more frequent on the maternal side. Hereditary pulmonary tuberculosis appears generally at an age varying from 13 to 35 years, without reference to the age at which it appeared in the parent. Hereditary tuberculosis is manifested at a less advanced age than acquired tuberculosis. Tuberculous heredity from both parents increases the chance of transmission to children. In tuberculous families one generation may perhaps be free from the disease, but others attacked by it.

3. Pulmonary tuberculosis sometimes exhibits a morbid selection which visits death upon degenerate families. The advance of the disease is aided in the ancestors by the existence of tuberculosis, cachectic affections, general paralysis, insanity, idiocy, etc. In offspring it is explained by the presence of osseous pulmonary tuberculosis in some and in others by arrest of development, deafness, inflammation of the middle ear, coxalgia, and infantile paralysis.

4. Diseases of the bones and of articulations are met in 20 of every 100 of tuberculous families. Tubercular affection of the bones and joints in most instances precedes the pulmonary symptoms.

5. Marriage of a healthy person or of a healthy descendant with a tuberculous individual or with a person in whom tuberculosis is hereditary, diminishes the risk of inheritance of the disease in the offspring of such a union.

6. Propogation of tuberculosis in families by infection is the exception.

7. Marital contagion is at least extremely rare, and has not appeared possible only in seven families in sixty-eight.

8. The progress of tuberculosis is much more gradual in the higher than among the laboring classes. The poor in whom the disease is arrested, die frequently of intestinal disease consecutive to the original manifestation.

9. Rapidity or slowness in the advance of the disease has no relation with heredity.

10. Cure of tuberculosis is met, as well in instances of hereditary, as in acquired phthisis. Tuberculosis may be cured at all stages of its existence, but crude or softened tubercle of little extent is that most frequently cured.—*Archives Générales de Médecine*, May, 1885.

Suggestions for the Investigation of Anæsthetic and Tuberculous Leprosy.

Dr. W. ALLEN STURGE, in a paper analyzing the nerve phenomena of anæsthetic leprosy, insists on the distinction to be drawn between anæsthetic and tuberculous leprosy, and suggests the following points for investigation:—

1. In mixed cases of tuberculated anæsthetic leprosy, to notice accurately the difference between the eruption of parts of the skin where sensation is healthy, and that of patches of anæsthetic skin. With a view to proving the secondary influence of nerve disease in checking the morbid growth in the skin.

2. Is anæsthesia always preceded by modification in skin nutrition? With a view to proving the independence of the nerve disease.

3. Does the primary invasion of anæsthesia ever give rise to patches of numbness corresponding to the supply of any named nerve? With a view to clearing up the question whether nerve-trunks are ever subjected to direct attack.

4. Does muscular atrophy ever take place without being preceded by anæsthesia? With a view to proving whether ultimate motor branches may be primarily affected, in a way similar to ultimate sensory branches.

5. Where muscular atrophy has taken place, to make a detailed examination of the various group of muscles. With a view to confirming or confuting the conclusions arrived at above, in reference to the mode in which their atrophy is produced.

6. An investigation of the deep sensibility of parts beneath anæsthetic skin, and a comparison of the deep sensibility of healthy muscles as compared with that of atrophied muscles.—*Brain*, April, 1885.

The Pathological Anatomy and Course of Syphilitic Disease of the Skin.

Professor J. Neumann, at a meeting of the Berlin Medical Society, held March 20, 1885, called attention to the following peculiarities in the history and anatomical appearances of syphilitic disease of the skin:—

1. Syphilitic skin disease takes its origin, as other observers already had found, anatomically from a growth of round cells adjoining the vessels. This is certainly adjoining the vessels of the upper cuticular layer, and of papillæ which become diseased, and also to the vessels of the deeper layers. The intensity of the pathological changes in the recent form of the macular syphilide is slight, but increases in marked degree in the papular and tubercular eruptions, and in gummata.

2. The pathological products in the macular variety of the disease are limited to papillary bodies, without extension into the epiderm. Ordinarily, as the progress of the disease extends, this boundary will be exceeded, and the rete be infiltrated with the cells, so that they unmistakably come to be situated under the tense horny layer.

3. The exudation cells are, in the recent stage, unmistakably *round* cells; after a longer period they lose the circular form, become lengthened and spindle-shaped, and, as such, seem to preponderate on the outer wall of the vessels.

4. The pigment is found usually in the form of granules of various size and color, ranging from orange to brown. The granules lay partly in the exudate and partly in the connective tissue. In the first, *i. e.*, the exudate, absorption readily takes place; in the second, *i. e.*, the connective tissue, it is effected with difficulty or not at all. If the proliferation of cells extend into the rete, then are they also pigmented, and coloring matter is found even in the tubules described by Ehrmann. The tissue of the papillæ seems spongy, and cloudy, with molecular *débris*. This cloudiness is evident, also, in cutaneous gummata in the deeper layers of the skin.

6. The follicles are changed in various respects. The hair follicles are not only surrounded by round cells, but the outer layer of their walls is also thickened, but presents, especially in the acneform and lichen eruptions, club-shaped branches and extensions. The same changes are also observed in the sebaceous follicles.

7. In this connection the appearance of giant cells is noteworthy, which, taking place in the tubercular forms, and preponderating in the lichen and acneform eruption, is still further manifested in cutaneous gummata. In the macular, recent lenticular syphilide, as well as in the primary forms, Professor Neumann has never found them.

8. Some portions of the cuticular tissue appear to offer a special resistance to the disease. So, also, unstriated muscular tissue. In some sections the round cells were found to correspond to the course of the vessels in the erectile tissue,

while in the scrotal papillæ, in which the fibre cells are extremely abundant, the tissue is found completely free from syphilitic infiltration.

9. The different varieties of syphilitic skin disease are due only to variations in the intensity of the disease, and are a result of one and the same process; consequently, no distinct boundary separates the different forms. Nevertheless, in some cases, the follicles, while in others the papillary bodies, whose vessels are attacked, serve as the starting-point of the disease.

10. Pigmentation, after recent syphilis, progresses with the disappearance of the inclosing round cells by absorption.

11. In conclusion, the most important result obtained by these investigations is the discovery that, after the disappearance of the clinical symptoms of the disease, the anatomical changes still remain. Exudation cells still persist in the cutaneous tissue, and even pigmentation, though the clinician cannot detect with the eye any evidence of the disease.—*Allgemeine Wien. Med. Zeitung*, March 24, 1885.

SURGERY.

Case of Perforating Tuberculosis of the Skull with Cerebral Symptoms.

Mr. WALTER EDMUNDS reports a rare case of perforating tuberculosis of the skull in which cerebral symptoms were also present. The patient was a boy, aged 14, of a rather delicate family, one of his sisters having died of hip disease.

Eighteen months before admission he had an attack of peritonitis which was thought to be tubercular.

About the same time there formed on the left side of the scalp over the parietal bone a cold abscess, accompanied by much headache; this abscess was twice aspirated, and thick pus drawn off each time.

Some six months later he complained, on and off, of numbness in the right arm and hand, and four months later the abscess in the scalp began to fill again.

Two days before admission he had a fit—the first he had ever had. He felt giddy, fell, became unconscious, foamed at the mouth, bit his tongue, and passed water involuntarily; both legs were convulsed, and the right arm clenched and drawn up.

State on admission: A pale but well-nourished boy; on the left side of the scalp is a soft fluctuating tumor, from which a mixture of blood and pus can be drawn out with a fine syringe.

The grasp of the right hand is much weaker than that of the left; the right leg is also weaker than the left, but the difference is only small; there is, too, slight right facial paresis.

Sensation everywhere normal.

Ophthalmoscopically both disks are slightly swollen and their margins blurred; the veins kinked, and white lines along the vessels. No hemorrhages.

Temperature normal. Sleeps well. No headache. No albumen or sugar in urine. He never vomited, and never noticed any defect of sight. Knee-reflexes normal.

Under ether the abscess was laid freely open. At its base was found a piece of diseased bone of oval shape, measuring seven-eighths by five-eighths of an inch; it was depressed on one side, and nearly completely separated from the surrounding bone, so that with an elevator it could be lifted up and removed.

It comprised the whole thickness of the skull, the dura mater being exposed and the pulsations of the brain seen.

The wound was dressed with iodoform, and (except for the formation of a diminutive aneurism in the scalp which had to be opened) progressed uniformly well; there was, however, some suppuration with loss of substance on the surface of the brain.

He had two fits subsequently; one two weeks, the other eight weeks, after the operation; in both of them the head was turned to the right; he had general convulsions, and foamed at the mouth.

The discharge from the openings in the skull gradually diminished, and the scalp covered over the edges of the skull, so that when he was discharged there was an opening in the scalp and skull through which the brain could be seen. A silver plate was made to protect this.

The inflammation of the optic disks gradually subsided, but that of the right eye is not yet quite normal.

In about four months he was sufficiently well to get up and walk about; the chief thing remaining wrong with him, besides the opening in the skull, was the weakness of the arm and hand, the strength of the right hand being only a third of that of the left.

The opening of the skull was half an inch in front of the middle of the fissure of Rolando; but as the superficial ulceration of the brain extended for a short distance backwards from the opening, the middle of the ascending frontal and ascending parietal convolutions were affected. Probably the centre marked VIII. and one of the centres marked X. by Ferrier were involved; these are concerned, he says, with the flexion of the forearm and the movements of the hand and wrist.

The case is interesting as an example of a somewhat rare disease, already described by Volkmann, and also as showing a coincidence between the localizing cerebral symptoms and the measurements on the surface of the scalp.—*Brain*, April, 1885.

Fracture of the Larynx; Tracheotomy; Cure.

M. MARCIGNEY reprints a case of fracture of the larynx followed by tracheotomy and resulting in recovery.

The patient, a laborer, fell from a light wagon, not loaded, one of the wheels of which passed over the right side of his face and neck, which was thus compressed laterally. He reached his home, however, which was located near the place of the accident, suffering at the same time from slight hemorrhage from the left ear, the nose and the mouth. At first the voice was not altered, but three or four hours after the accident he was neither able to speak nor swallow, and experienced severe pain in the neck, which was slightly swollen.

During the night he spat blood, and respiration became difficult. The following morning he entered the Hôtel-Dieu as a patient of M. Tillaux. Examination showed the face to be swollen, and ecchymosed beneath the orbits. The mouth could with difficulty be opened, but no fracture of the jaws existed. The neck was considerably swollen; the skin, which was very tense, exhibited on each side of the larynx some slight ecchymosis. Subcutaneous emphysema existed in the supra- and subclavicular regions, descending to the chest, and slight, exceeding the median line. Respiration was very difficult, and the patient maintained a sitting posture as most favorable for its performance.

There was expectoration of sanguino-mucous matter. Speaking was difficult, and the voice was deep. The larynx was flattened and transversely enlarged at the level of the thyroid cartilage. Pressure in this region was very painful, and palpation showed that the two wings of the thyroid cartilage are separated, and though fracture existed, the intensity of the pain prevented sufficient investigation to discover the degree of mobility of the fragments.

Deglutition was very painful. There was no pneumothorax, nor fracture of the ribs. The temperature was slightly elevated, being 101.1° F. in the morning and 101.8° F. in the evening. Dry cups were now applied to the chest, but the dyspnœa, nevertheless, became so much aggravated that breathing was only possible in a sitting posture.

Further examination being made, M. Tillaux was able to obtain slight crepitation of the fragments of the cartilage, and in view of the intense dyspnœa ordered preparations for tracheotomy, should it become necessary.

A short time subsequently the patient was seized with a violent suffocative attack, in which he narrowly escaped death, and tracheotomy was at once performed. The skin and muscles were divided rapidly with the thermo-cautery, expiration during this procedure becoming progressively more feeble. The trachea was cut with the bistoury, and a canula at once introduced. At the completion of the operation the patient was apparently dead. Artificial respiration was at once resorted to, and after being continued for some minutes the patient revived. The day following he was comparatively comfortable; the dyspnœa not being returned, and the subcutaneous emphysema having made no progress. Three weeks subsequent to the operation M. Tillaux removed the tracheal canula, and respiration was normally carried on without difficulty.

Antiseptic dressing was applied to the wound, which was in good condition. The voice, however, had not recovered its natural tone, and was still somewhat muffled.

M. Marcigney concludes his report of the case by reference to the statistics of fractures of the larynx, as collected by M. Hénoque, who, out of 52 cases, reports 19 cures and 43 deaths, a mortality of 82 per cent. In the prognosis the relative benignity of the symptoms during the first few hours showed here no weight, inasmuch as though infiltrations of the cellular tissue be slow at first, under the influences of respiratory efforts it may rapidly progress and produce asphyxia in a few months.—*Journal de Médecine de Paris*, May 24, 1885.

Total Extirpation of the Larynx.

Dr. LÉON LABBÉ, at a meeting of the Académie de Médecine de Paris, held March 24, 1885, reported an operation for the total extirpation of the larynx. The patient, a man aged fifty-nine years, had suffered for three years from aphonia, soon followed by dyspnœa. Examination made showed the portion of the larynx below the glottis was filled up by a tumor. Tracheotomy was performed, and considerable relief at first resulted to the patient, but the tumor continued to grow, and at length became a source of renewed discomfort. The patient now consulted M. Labbé. The tumor was found to have invaded the ventricle of the larynx and to have extended into the pharynx. The epiglottis was firmly closed. The orifice of the larynx was almost completely closed and œsophageal catheterization was nearly impossible. The patient suffered exceedingly at every effort of deglutition. There was no swelling of the glands. M. Labbé now determined to perform total excision of the larynx. Chloroform was administered through the tracheal canula of Trendelenburg and nearly complete anæsthesia obtained. A T incision was first made, the long branch of which extended vertically from the hyoid bone as low down as possible. The larynx was next isolated and extirpated; for this portion of the operation the galvano-cautery alone was used. The larynx was drawn from below upward, and the wound sutured above to diminish its extent. An œsophageal sound was introduced into the œsophageal wound, and on the fourth day iodoform was substituted as a dressing for washing and carbolic applications. On the fourteenth day the temperature and pulse of the patient were normal, pain had disappeared, and the wound had rapidly contracted. Alimentation was easily effected. Examination of the tumor showed it to be a spindle-celled sarcoma. This operation, first performed by Billroth, had never been previously done in France.—*Gazette Hebdomadaire de Méd. et de Chirurgie*, March 27, 1885.

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Lateral Laparotomy.

Dr. Polaillon, in the *Gazette Médicale de Paris*, of April 25, 1885, in advocating lateral laparotomy, claims its superiority in many cases over the median operation. He says: Laparotomy for intestinal occlusion is ordinarily practised in the median line. The median incision is of advantage when nothing is known of the nature or location of the obstacle. But if the intestines are distended with gas, there is danger if it be practised of affording a too ready exit to the intestines, and there is frequently great difficulty experienced in replacing them and in suturing the abdominal walls. From the same cause prolonged taxis is frequently necessary, and puncture is sometimes even required to render reduction possible. These manœuvres gravely compromise the success of the operation.

Contractions of the diaphragm which drive the intestines directly from above downward, and from behind forward, against the lower portion of the abdominal region, and in the median line of the abdominal wall, explain this tendency to irruption when the abdominal cavity is opened in front. Theory indicates that would be sensibly the same upon the sides of the belly; however, the escape of the intestines is less to be feared if a lateral incision is made. Having had occasion to practise laparotomy very frequently in the ilio-inguinal region, by an incision parallel with the fibres of the external oblique muscle, I have been struck at seeing the intestines have no tendency to hernia by such incision, although the swelling of the belly was considerable. When the intestines, distended by gas, render the abdominal wall prominent in front, it is easily understood how a median incision permits their sudden escape, but lateral incision made in the midst of muscular fibres has tense borders which do not separate from each other and which contribute in a great degree to retain the intestines within the abdominal cavity.

The natural approximation of the lips of the incision seems to me to be the principal cause which prevents the exit of the viscera in lateral laparotomy; and secondarily the intra-abdominal pressure is perhaps less in the ilio-inguinal region. The ilio-inguinal incision in other respects, too, permits the ready execution of laparotomy. An incision of sufficient extent to permit the ready introduction of the hand for abdominal exploration is easily made. The epigastric artery or its branches is generally cut, but one or more ligatures are easily applied. *Lateral laparotomy*, therefore, is, equally with the median operation, a surgical procedure in the treatment of intestinal occlusion, and each has its advantages according to the special indications. Although in median laparotomy there is danger of irruption of the intestines, it is to be preferred when the location and nature of the occlusion are unknown, because it permits minute exploration before removal of the cause of obstruction. In lateral laparotomy exploration is less easy, but this operation is indicated in all cases of localized obstruction, circumscribed adhesion, or when any symptom renders it probable that the obstruction exists in one or the other side of the abdominal cavity. Under such circumstances the obstacle is more directly reached, and if it becomes necessary to make an artificial anus, the best conditions for such operation are obtained.

Laparotomy performed for Ileus.

Dr. EDGAR KURZ reports a case of laparotomy performed on account of intestinal obstruction. The operation resulted in the complete recovery of the patient, and is interesting as being extremely rare in private practice.

The patient, a man aged 33 years, twelve months previously had a severe attack of typhoid fever attended with numerous complications. He recovered, however, and perfectly regained his health.

In August, 1884, for the first time, he noticed a small hernia into the right inguinal canal which did not descend into the scrotum, and could easily be replaced within the abdominal canal. October 23, 1884, Dr. Kurz was summoned to the patient, and found him suffering severe abdominal pain, attended with vomiting. Examination made at once, and the following day made it clear that the hernia was not the cause of the pain and vomiting. Palpation of the abdomen was not painful; the urine was clear; and after an enema, which was followed by a movement of the bowels, the pain grew less severe. However, the following night the pain returned, as also did the vomiting. No results from enemata; no evidences of hernia; and the patient's countenance was the characteristic *facies abdominalis.* Diagnosis was accordingly made of ileus. As to its cause and location nothing could positively be stated. The condition of the patient constantly became more serious, as evinced by stercoraceous vomiting, hiccough, and increased pain in the abdomen. The temperature on Oct. 29th and 30th was 97.3° F.; pulse 80. Oct. 31st, the temperature became still lower, being only 96.4° F. November 1st, the condition of the patient being in no wise improved, operation was decided upon. After evacuating the bladder the abdomen was opened in the linea alba under a one and a half per cent. carbolic spray. While the incision was being made a severe attack of stercoraceous vomiting came on. Examination revealed no signs of peritonitis. Search was now made for cause of the obstruction, and a finger introduced into the ileo-cæcal region discovered the presence of a ring in which the colon had become ensnared. It was so tightly held that moderate traction was unable to release it, accordingly a probe-pointed bistoury was introduced and the ring twice incised. The bowel was now readily withdrawn, and was found to be injected and intensely red. The neck of the hernial sac was found to be a hand's breadth from the internal ring, which at once explained the negative result of all previous examinations. After the replacement of the intestine the abdominal wound was closed by three silk peritoneal and six superficial sutures, which were rendered antiseptic by previous boiling in a 5 per cent. carbolic solution. Iodoform was then applied and the wound covered with carbolized gauze, held in position by strips of adhesive plaster. The operation lasted scarcely half an hour.

The case progressed rapidly to recovery. Movement of bowels took place for the first Nov. 6th, and the 12th of November he was able to take short walks and drives. At the present time he has resumed his ordinary employment, and is perfectly well. Defecation is normal, and all traces of the hernia, previously existing, have disappeared.—*Deutsche Med. Wochenschr.*, March 26, 1885.

Internal Strangulation by a Band situated at the Level of the Fibrous Cord of the Obliterated Umbilical Artery; Laparotomy in the Iliac Region; Release of the Intestine followed by Cure.

At a meeting of the French Surgical Society, held April 2, 1885, Dr. POLAILLON, reported a case of laparotomy in the iliac region, performed on a young man aged 17. The patient related that he had never been ill, but that for eight months he had noticed a hernia, the size of a pigeon's egg, in the right inguinal region.

The patient entered the hospital the 23d of July, 1884. A week previously he experienced very severe pain originating at the hernia and radiating over the abdomen. The history of the condition, which was not intelligently related, made it appear probable that the hernia, at the time pain began to be experienced, had became irreducible, and since this occurrence had never disappeared.

July 16th, he began to vomit dark-green and exceedingly bitter matter, and this condition was maintained for several days, the belly in the mean time becoming very much distended, the last movement of the bowels occurred July 15th. Examination made July 23 revealed the presence of great prostration; tongue pale, but not dry; pulse regular and full; respiration normal; urine free from albumen. The matter vomited was without unpleasant odor, but was stercoraceous in appearance. Constipation was complete, and flatulence was absent. There was no obvious cause of occlusion. Both inguinal rings were free.

The necessity of operation in order to re-establish intestinal motions being plainly demanded, it was decided to perform laparotomy, and, under the hypothesis of a right inguinal hernia, it was decided to make the incision in the iliac region rather than in the median line. The operation was done under the carbolic spray. An incision between three and four inches long was made, and deepened gradually until the epigastric artery was reached. This vessel was then tied and cut, and the peritoneum opened by small incision. Digital examination showed both inguinal rings to be perfectly free. To permit free examination of the abdominal cavity, the peritoneal incision was now enlarged, so as to equal the cutaneous wound. The hand was then introduced and search instituted for the cause of obstruction. Nothing was discovered until the hand on the left of the abdominal cavity encountered a falciform fold, extending from the left inguinal region toward the umbilicus, and probably formed by the fibrous cord resulting from the obliteration of the umbilical artery. Between the fold and the abdominal wall there was formed a peritoneal sac, extending from above downward, and from without inward, sufficiently large to contain numerous intestinal folds. The cause of strangulation, however, still remained undiscovered, and the search therefor was continued by examining carefully the whole intestine. Nothing abnormal presented itself except considerable injection of the intestine, until a fold of the bowel was found about ten inches in length, the extremities of which were markedly retracted and diminished in calibre. Beyond and below the constricting points the intestine regained its normal appearance and volume. At the location of the constriction there were evident points of subperitoneal ecchymosis, and a slight furrow resembling the scratch of a nail, and upon the mesentery points of ulceration and appearances of false membrane were visible. The cause of the strangulation evidently existed in the presence of the fold—described above—but the simple introduction of the hand into the abdominal cavity had been sufficient to release the bowels, thus at first rendering the mechanism of the strangulation obscure.

The cord or fold was not cut in view of possible danger of serious hemorrhage. The constricting portion of the intestine was carefully washed with carbolized water, and the epiploön replaced over the intestines, and the wound closed with five deep and six superstitial sutures. Antiseptic dressings were applied and covered with wadding, and bladders of ice placed over the belly. The evening after the operation the temperature rose to 102.9° F. Absolute diet, fragments of ice to allay thirst, and hypodermic injection of morphia. Frequently vomiting during the evening and night. The day succeeding the operation the belly was much less distended, the vomiting had ceased, and gas escaped by the rectum. The temperature was reduced to 100.4° F. with slight evening exacerbation. The second day the temperature was normal, and the general condition of the patient much improved. Three days after the operation there were two copious diarrhœic discharges from the bowels. In ten days all sutures were removed, and in one month the patient left the hospital completely cured.—*Gazette Médicale de Paris*, April 25, 1885.

Rosacic Urine.

At a recent meeting of the French Congress of Surgery, M. VERNEUIL presented a paper upon Rosacic Urine, the conclusions upon which are the following:—

1. The urine sometimes presents, in the wounded and in those undergoing operations, a red deposit adherent to the vessel recognizable at sight without the aid of reagents, and formed by a particular substance to which may be applied the term rosacic acid.

2. This phenomenon coincides generally with oliguria and concentration of the urine, which are ordinary consequences of traumatism. It is early developed, being apparent soon after the reception of a wound. It is, however, transient, and persists only from one to three days, and rarely reappears during convalescence. It indeed easily escapes attention, and may require care in order for its detection.

3. It may appear after all kinds of open wounds, interstitial or other, and in patients either robust or delicate, of sound constitution or afflicted with some anterior constitutional disease, and therefore its origin and signification seem at first obscure, but careful examination of its antecedents, the coincidence with other symptoms, and finally the results of *post-mortem* examinations, establish clearly that it depends upon diverse lesions of the liver, steatosis, amylosis, cirrhosis, chronic congestion, hydatids, and cancer.

4. The hepatic changes caused by alcohol seem to have more than all others an influence in causing red urinary deposits under the exciting influence of traumatism, for this symptom is frequently observed in more or less confirmed tipplers, as a result of various surgical accidents and operations.

5. Rosacic urine has therefore a real semeiotic value, inasmuch as it indicates almost certainly a morbid condition of an important viscus—a condition frequently latent—difficult to recognize, and which moreover exerts an influence more or less harmful upon the progress and termination of surgical diseases and traumatic lesions.

6. Its prognostic value is not less important. Doubtless the red urinary deposit is not always followed by accidents to the wounded part, but the gravity of the accidents, if they do occur, are in relation with the extent, degree, and form of the hepatic lesions. Nevertheless, it is of importance to know in advance to what complications those with rosacic urine, when operated upon, are liable. According to M. Verneuil's personal experience these accidents are consecutive hemorrhage and gangrene.

7. To prevent as much as possible, or to combat these serious complications, it is necessary to insure hæmostasis and asepsis in the traumatic region by utilizing all modern appliances, and by simultaneous medical treatment before, during, and after the operation.

8. Though the therapeutics of alcoholic cirrhosis is as yet little advanced, nevertheless none of its resources should be neglected in wounded habitual drinkers or in those of them who are to be operated upon, when their urine exhibits the characteristic rosacic deposit.—*Revue de Chirurgie*, May, 1855.

Complete and Permanent Cure of Ischuria due to Prostatic Hypertrophy by the Galvano-Cautery.

Professor E. Bottini, by an operation entirely original, has succeeded in permanently relieving ischuria due to prostatic enlargement. The operation was performed July last, and the permanence of the results gives promise of a noteworthy addition to the surgical treatment of prostatic disease, which heretofore has been considered as almost entirely tentative.

The patient was a man aged sixty-eight. Ten years ago he first was affected with a sabulous discharge of light-yellow color. In the beginning of the year 1880, for the first time, he experienced some difficulty in urination, and the act was preceded or followed by severe smarting. In 1881 the difficulty had become so great that he urinated every two hours. Examination made at this time by Dr. Scudellari showed a urethral construction due to enlargement of the prostate. At this time thirteen ounces of urine were removed which had remained permanently in the bladder. Progressive dilatation was resorted to, but failed to be of any advantage. The urine having now become very turbid and strongly ammoniacal in its odor, Dr. Bottini was called in consultation, and the patient was found to have lost much strength, and his general appearance was that of great debility. The prostate was discovered to be much enlarged, and cauterization was proposed. Previous to the operation the bladder was treated with solutions of boracic acid and sulphocarbolate of zinc, and the attempt was made to strengthen the contractility of the bladder by cold injections, and after some weeks the local as well as the general condition of the patient was much improved. The urine under this treatment became neutral, then acid, and finally alkaline, as at first, and the patient was able to expel the urine several inches from the mouth of the catheter. The conditions now being apparently favorable for operation, the patient was chloroformed and the galvano-cautery introduced into the urethra, with the cauterizing blade against the prostatic enlargement. The instrument was so constructed that all parts, save that by which the heating was necessary, were kept cool by a current of ice-water. Cauterization of the prostate was continued forty-five seconds, which then being deemed sufficient from the inclination of the instrument, the current was broken. On the withdrawal of the cautery all portions were found to be cold. The patient was carefully put to bed, and a catheter left in the urethra.

The fourth day after the operation the patient was without fever, and suffered only slightly from vesical tenesmus, which promptly yielded to treatment with belladonna suppositories. The 9th of July the syringe was removed, and the urine ordered to be drawn every six hours, and the bladder to be washed out morning and evening with a two per cent. solution of sulphocarbolate of zinc, to prevent putrid fermentation and septic absorption. The seventh day small portions of escharotic tissues began to escape with the urine, which, becoming more abundant for a few days, gradually diminished in quantity without ill effect upon the patient. The first spontaneous discharge of urine occurred July 27th, or twenty-four days after the operation, beginning with a few drops, which gradually increased until, on the evening of the 5th of August, seven ounces were passed. By the 3d of October the urination was entirely natural, and the amount passed normal in quantity and quality. To restore the activity of the vesical muscles, ext. nuc. vom. was administered internally, and topical application of the induced electric current was made. On the 23d of January of the present year the improvement still continues, and the general health of the patient was excellent.—*Gazzetta degli Ospitali*, February 11, 1885.

Traumatic Urethral Stricture Cured by Excision.

Dr. ROBSON, in *The British Medical Journal* of March 7, 1885, reports a case of traumatic urethral stricture cured by excision. Concerning such operation he says: All narrow strictures of the urethra may be cured by excision, if situated anterior to a point half an inch in front of the membranous urethra; easily if behind the scrotum; without much difficulty, if covered by the scrotum or even if penile.

Whilst formulating such a rule, I would have it clearly understood that I would not advise or practise excision of the stricture unless it did not yield easily to the ordinary forms of treatment, or rapidly relapsed into its old condition.

The preceding indications obtained in a case under Dr. Robson's care, the operation was decided upon and performed as follows: The man was etherized and placed in the lithotomy-position, when Mr. Wheelhouse's staff was passed down to the stricture, the scrotum held up, and the urethra laid open for half an inch in front of the stricture, which was carefully divided, and the urethra laid open for half an inch behind this. The stricture being thus fully exposed, was found to consist of a fibrous cicatricial band about one-fourth of an inch wide, involving mucous membrane, submucous tissue, and bulb-tissue. The whole of the cicatrix was excised, and the cut ends of the mucous membrane were drawn together over the gap thus formed, and secured by continuous catgut suture; a catheter being then passed into the bladder, the vertical incision into the urethra was united by catgut, thus closing the canal, and leaving a continuous and closed urethra. The last sutures were an after-thought, and perhaps unnecessary, for they gave way on the second day, and the urine partly escaped for some little time by the perineal wound, which healed by granulation, as in the ordinary *boutonnière* operation. For the first two days after operation, the temperature reached 101°, but was afterwards normal.

Concerning the operation, Dr. Robson remarks: I was astonished to find how very easily the mucous membrane could be made to cover the gap without any tension; evidently due to the abundant submucous tissue allowing the mucous membrane to slide freely over the subjacent tissues. I feel sure it would be quite easy to cover in a space of half or three-quarters of an inch. The result in this case would seem to prove that the vertical slit may be safely left to close by granulation; and this may probably be better than absolutely closing the whole canal, and so preventing drainage.

The result has almost exceeded my expectation, as I thought there might be a tendency to relapse; but, since a No. 13 sound will pass without a hitch six months after operation, I think we may conclude that a genuine cure has been effected.

One Hundred Cases of Varicocele treated by the Subcutaneous Wire Loop.

Mr. RICHARD BARWELL, in *The Lancet* of May 30, 1885, briefly describes the operation for varicocele with the subcutaneous wire loop, and gives the results of one hundred cases thus operated upon. He says:—

The only instruments required are a needle armed with about ten inches of silver wire, gauge twenty-six, or even a little less; a pair of pliers, and an oval shield of vulcanite, one-eighth of an inch thick, with a long diameter of an inch, a short one of about three-quarters of an inch. Near each end is a brass upright, projecting a quarter of an inch. Close to the spots where these uprights are fixed the shield is perforated by oblique channels which open on the other side near the centre. The surgeon must very carefully separate all the veins from the vas deferens, and squeezing together between his left thumb and index the two sides of the scrotum, he keeps the duct and the spermatic artery behind and the veins in front. He then thrusts the armed needle through that half of the scrotum from without inwards, thus placing the silver wire between the above-named parts; he then reintroduces the needle at the previous hole of exit, and when its point lies within the scrotal cavity he relaxes his grasp on that part, and partly by passing the needle onward, partly by manipulating the veins behind its point, he brings the original opening of entry towards it and extrudes the needle. It is only necessary to be sure that no veins escape, and that no part of the lining fascia of the scrotal cavity is included. When these manipulations are completed the veins are encircled by a loop of wire, the ends of which hang out of one puncture at the outer side of the sac. These ends are passed each through one of the holes in the shield, and when drawn sufficiently tight are secured by twisting them round the uprights. It is well, however, to place three or four folds of lint—or better still, a piece of felt, in which a slit has been cut—between the shield and the skin. Every other day the wire must be unwound from one of the uprights,[1] tightened, and replaced. Thus it acts as a very slow écraseur and cuts through the veins in some time between eight and sixteen days, according to the bulk of the varicocele.

Of the 100 cases operated on by me in hospital and private practice I have kept notes; their analysis is as follows: In no case was there any bleeding, shivering, pyrexia, erysipelas, or other disquieting manifestation. In 16 there was slight suppuration; in 15 of these the pus found its way out along the wires, and gave rise to no trouble; in 1 a little abscess formed in the thickness of the scrotum and was evacuated by an incision one-third of an inch long. In 12 there was a little ulceration where the shield pressed against the skin; it healed when the wire came away. In 1 there was some orchitis, which lasted five days. In 71 there were none even of these trifling complications, the course of events being precisely like that of the cases above recorded. Three patients would not submit to be confined, but walked out after the second day; one of these belonged to the class in which some suppuration occurred, the other two to that in which no complication took place.

The above may be termed the immediate effects of the operation. There remain still to be considered the remote or ultimate result, and therewith the conditions previous to operation.

A (1 case).—Testicle only represented by a small pultaceous mass; the bunch of veins considerable, larger than the gland. (Patient aged twenty-seven.)

B (13 cases).—Testicle very soft and small.

C (47 cases).—Testicle much diminished and of considerable softness.

D (32 cases).—Testicle somewhat diminished and soft.

E (7 cases).—Slight varicocele operated on for the sake of passing examination.

In the first four categories, chiefly in the second, third, and fourth, the organ was the seat of more or less pain; in 23 cases this was severe.

A.—The pain ceased, and the testicle became both a little harder and larger; the patient thought it regained some function. He married five months after the operation, and is the father of four children.

B, *C*, *D.*—In every case the testicle became harder, and regained some of its dimensions immediately after the operation, but did not entirely resume its natural consistence and size until after a considerable time; in some of the worst cases, so far as I was able to trace, being as much as two years; in others, and more especially in the younger patients, three months.

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[1] I have lately modified twisting the wire round the upright, and now fix it by means of a binding screw.

E.—The slight cases under this heading passed the examining board very soon after operation.

The safety and efficacy of the procedure are, I think, fairly attested by these results. The very slight degree of pain, either at the time or afterwards, should also be mentioned. I have operated on five cases without any anæsthetic.

First Reported Instance of a Shot Wound of the Lumbar Vertebræ, resulting in Recovery.

ALBERS, in the *Deut. Militärärztl. Zeitschr.* xiii. p. 10, reports the first known case in the literature of surgery of recovery from a shot wound of the lumbar vertebræ. The patient received in a duel a pistol wound from a weapon of smooth bore, and large calibre, about four-fifths of an inch above the crest of the right iliac bone. Blood at once streamed from the wound in great quantities. Compression bands over thick wads of salicylated cotton were applied round the body, the hip-bone of the opposite side of the body being used as the point of support, and the bleeding thus arrested.

The wounded man on receiving the shot fell instantly, entirely lamed in both legs, and in a half-fainting condition. He was carried one-fourth of a league to a wagon, and thence conveyed in the wagon one-half a league to a hospital. In the hospital ice was applied to the belly, and on account of the severe pain in his legs, a hypodermatic injection of morphine was administered. The following day peritonitis set in with a temperature of 103.6° F. No urine was passed, and the bowels were constipated. The treatment consisted of large doses of calomel and small doses of opium. The dressings of the wound were changed under antiseptic precautions, absolute rest and strict diet enforced. There was no recurrence of bleeding. The third day a small quantity of urine was passed with slight pain; no movement of the bowels; even after an enema. After the sixth day the symptoms of peritonitis abated, and on dressing the wound the bandage was found to be covered with a black scab, and from the wound which had previously been dry, a few drops of thin yellowish pus exuded. Attempt was now made to probe the wound, and the knob-pointed probe passed without obstruction to the third lumbar vertebra, over a rough spot in the latter at a depth of about one and one-fourth inches, and then came upon a hard body lying upon soft tissue.

In withdrawing the probe Dr. Albers discovered that behind it was met by a resistant elastic mass—in accordance with the situation of the spinal cord to the rear and to the front of the rough body of the vertebra. The diagnosis was accordingly made, that the ball without wounding the intestines had pierced the third lumbar vertebra, entering the spinal canal beneath the cord, and finally passing out of the vertebra, had embedded itself in the soft tissues beyond. No effort was made to extract the ball, and to assist drainage a tube was introduced.

The conclusion that the spinal cord was contused, but not wounded, was verified by the return of power to urinate freely. Eight days after the reception of the injury, with the existence of a light fever, 102° F., the discharge of pus from the wound was moderately abundant ($\frac{1}{2}$ to $\frac{3}{4}$ ounce daily). The dressing for the first twelve weeks was changed daily. A rise of temperature coming on, the tube was removed, and found to be clogged with pus, and pieces of cloth were also discovered. A new drainage tube was accordingly introduced and the wound washed with a four per cent. carbolic solution. After four weeks both legs were treated with a mild induction current. Fourteen days later there was slight motion in the right toes, and in two of those of the left foot. Three months after the injury was received, the right sural muscles had regained their contractility, but were without sensibility. After eight months, by means of a screw probe, a small piece of linen and a sequestrum one-third inch long and one-sixth inch wide, were removed, after which the discharge of pus was more regular, and the pain less. The following month the patient was able to sit up several hours at a time, and efforts made to move were encouraging. Four weeks later by aid of a cane took several steps. From this time forward improvement was steady; ability to walk increased, pain diminished, and the discharges from the wound gradually became less. His health and appetite were good, and all the bodily functions normal, except those of the bowels, which moved every third day. In a year and a half, the patient, as a convalescent, went to Wiesbaden, in two and a half years he was able to walk one hundred steps with a cane, and in three and a half years he was again active as Platzmajor at a celebration.

As rules for the treatment of gunshot wounds of the spinal column, especially in war, Dr. Albers suggests the following:—

1. Preservation of life is possible only by instant stoppage of hemorrhage.

2. After cessation of the bleeding, instant transportation from the field of battle into a hospital is possible.

3. The prompt application of salicylic dressing, changed daily to insure antisepsis of the wound.

4. Probing of the wound is only to be attempted after suppuration has begun and with a thick and knobbed sound.

5. Careful probing is necessary to discover the extent and gravity of the wound, and for immediate drainage, which is necessary for carrying off the suppurative products of the bone, and hindering the entrance of pus into the abdominal cavity, and for the formation of a granulating canal extending to the injured vertebra.

6. By the daily antiseptic dressing of the wound cleanliness is attained, and the occurrence of abscess guarded against.

7. During the time required for the healing of the wound the patient must be kept separate from those ill of any disease whatever, and care must be exercised that bed-sores do not occur.

8. The removal of the ball must generally be resigned to the extrusive effect of the developing granulations, which can remove without danger a heavy missile.

9. Even after the expiration of a year, it is possible for the lower extremities to recover from paralysis due to contusion of the spinal cord.—*Deutsch. Medicinische Wochenschrift*, February 19, 1885.

Extraction of the Ball of a Revolver from the Head of the Humerus. Use of Trouvé's Apparatus.

M. Hanotte reports a case, occurring in the practice of M. Duret, in which a ball of a revolver was extracted from the head of the humerus by the means of Trouvé's apparatus. The patient was wounded in the left shoulder, the external wound being at the inferior border of the great pectoral muscle, near its tendon. Little flow of blood followed the wound. The position of the arm was one of semiflexion, and held firmly along the trunk in a manner which immobilized the shoulder-joint. Movement of the limb was impossible. Some crepitus was noticeable, indicating the existence of arthritis, and while the arm could be to some extent elevated, it could not be placed in a horizontal position. Movements of rotation and of adduction were made without pain.

A probe introduced into the wound penetrated about two inches, but as this was followed by slight hemorrhage exploration was not continued. It seemed however, that the foreign body was located a little below and without the coracoid apophysis, as was indicated by a roughened prominence, somewhat sensitive and painful in this region. Some degree of paralysis existed in the arm. Antiseptic dressings were applied. About three weeks after the injury the patient was chloroformed, and the path of the ball explored, and it was found much more deeply located than was at first supposed. The prominence already mentioned was found to be the greater tuberosity of the humerus, which rotated under the fingers when the arm was turned. Further exploration revealed that the bullet had traversed a path transverse to the axis of the humerus. At a depth of two inches a body was met with which, while difficult to distinguish, was thought to be the ball, on account of its roughness and dulness of sound on being struck with the probe. The path of the ball being found to be near the brachial plexus and the pit of the axilla, further examination was postponed to a future time, when it was decided to attempt its removal.

Three days subsequently the patient was again chloroformed. Exploration with the grooved sound was negative, and the electrical apparatus of Trouvé was then tried. After several attempts the stylet of the apparatus was brought into contact with the foreign body, as was shown by the variation of the needle. The position of the stylet showed at once the path of the ball and its position in the wound, and unsuccessful efforts having been made to remove it by means of the forceps, it was at length decided to make an incision directly upon it. Accordingly, a longitudinal incision was made at the external border of the coraco-brachial muscle, and a second one perpendicular to it at the level of the pectoralis major, and through the skin and aponeurosis. The pectoralis major being thus exposed, an incision was also made into it by which the humerus was exposed. By the aid of the Trouvé instrument the cavity thus laid open was again explored, and the ball discovered and withdrawn by a curved gouge. Further examination showed that it had been imbedded in the head of the humerus to a depth of nearly four-fifths of an inch. The projectile having been removed, the divided ends of the great pectoral muscle were brought together by three sutures, and a drain introduced into the wound. A sufficient number of superficial sutures were introduced. The success of the operation is attributed entirely by the operator to the use of Trouvé's instrument, the location of the ball, and the depth of the wound being considered such as would have rendered success improbable without it.

Four days after the operation the wound was healed by first intention. On January 10th, eighteen days after the operation, the movements of the hand and arm were nearly normal; those of the shoulder were still impossible. In the muscles of this region the induced current was applied. On January 25th the movements of the shoulder were also restored, and the patient was able to carry the hand to the top of the head.—*Revue Médicale*, May 16, 1885.

Contribution to the Study of Osseous and Articular Localizations of Tertiary Syphilis.

Dr. MICHEL GANGOLPHE, of Lyons, at the recent meeting of the French Surgical Congress, made the following interesting additions to the literature of syphilis as affecting bones and articulations:—

(1.) *Localization of Gummatous Osteo-myelitis of the Long Bones.*—*A.* The rarity of observations upon gummatous osteo-myelitis of the long bones appears to result from insufficient *post-mortem* investigation. These lesions, generally multiple, exist however frequently as a latent condition.

B. Their macroscopic appearances are characterized:—

a. By porosities—furrows and grooves which tunnel the diaphysis, and by new bony formations causing the subperiosteal spaces to communicate with the medullary canal, which is generally increased in size.

b. By a reddish or golden-yellow color of the substance which fills the cavities and intra-osseous sinuses.

c. By their dryness.

d. By the rarity of sequestra of any extent.

The lesions are remarkable from an histological point of view:—

1. By the existence of a fibrillary tissue, adenoid, and containing in its meshes a considerable mass of small cellular elements, a part of which is on the road to granular disintegration; at the periphery of the lesions there frequently exists a process of sclerous limitation.

2. By absence of any noteworthy lesions of the vascular system.

C. The separation of the osseous tissue affected by gummatous osteo-myelitis appears due to a process of osseous and fibrous sclerosis.

D. The hæmatopoietic functions of the osseous marrow permit these lesions to be considered as analogous to ganglionic disease of the spleen.

E. Tertiary syphilis by its local manifestations renders the bones more fragile; the existence of atrophy or of general rarefaction of the osseous system is still to be demonstrated. No anatomo-pathological fact demonstrates the occurrence of a fracture as a result of simple rarefaction without localized lesions.

(2.) *Localization of Syphilitic Osteo-arthritis.—A.* Articular lesions—having for their cause tertiary syphilis—are not primitive, but consecutive to epiphyseal or juxta-epiphyseal syphiloma. It is not proven that extra-osseous gummatous deposits, or sub-synovial lesions are able to determine secondary arthritis. In the opinion of the author there exists a single type only of tertiary syphilitic arthropathy, namely, *osteo-arthritis.*

B. The lesions present different characteristics, according as they are studied at the period of their *origin, establishment*, or *cure.*

1. The initial period is characterized by the appearance and development of a gelatinous tissue, red, in the epiphyseal or juxta-epiphyseal region. Gradually the alteration extends to the diarthrodial cartilage, which is thinned, eroded, and finally perforated. Nevertheless, in certain circumstances, there is noticed an encystment of the syphiloma, the periphery of which is surrounded by fibrous tissue, and by a zone of eburnation.

2. The period of *establishment* is characterized by increase in the number and calibre of the ulcerations, and by perforations of the cartilage; while, at the same time, more or less destructive change is observed at the articular extremity of the bone. The resulting loss of substance is hidden by a new formation, darkish-red in color, and thickened, but at no time fungous. The synovial membrane is thickened and inflamed, and a sero-purulent fluid fills the joint. The ligaments of the joints are generally intact, except that, in some cases, the gummatous alteration attacks their insertions into the osseous structure. There are no fungosities; however, the portions of the diarthrodial cartilage attacked by the disease are adherent to the subjacent space of tissue, contrary to what is observed in tubercular osteo-arthritis.

3. After having destroyed the major part of one articular extremity, these lesions may either disappear spontaneously or under the influence of specific treatment.

At those points where the diarthrodial cartilage has disappeared, the spongy epiphyseal tissue is eburnated, irregular, and covered by a very resisting, newly-formed fibrous synovial membrane. The cartilaginous islets, still persisting, are unequally prominent, and are separated by star-like depressions.

The articulation appears to contain a normal amount of serum, and possesses its normal physiological function to such a degree that it is difficult to determine, in the living subject, the extent of the lesion. There are observed generally on the same subject, and sometimes upon the same portion of the skeleton, an epiphyseal syphiloma, and a diaphyseal gummatous osteo-myelitis. These epiphyseal foci are most frequently multiple.

C From a clinical point of view gummatous osteo-arthritis is characterized by a more or less marked deformity of the articular extremities, and sometimes by diaphyseal tumefaction, by thickening, variable in nature and extent, by crepitation, by multiplicity of the affected articulations, and by the relative indolence of the lesions.

D. All operative intervention appears contraindicated.

The Laws Regulating Continuous Extension as applied to the Lower Limbs.

Dr. J. HENNEQUIN completes, in the April number of the *Revue de Chirurgie*, an exhaustive study of the laws regulating the application of extension to the lower limbs. The following are the conclusions at which he arrives:—

1. Weights and heavy bodies of a determined value should be employed in extension, to the exclusion of elastic cords in which the force of extension exerted is too variable and very frequent entirely inefficacious.

2. The apparatus of extension should have its point of resistance upon the skeleton of the mobile segment in order that the force which it exerts may be of utility.

3 Extension, active force, counter-extension, passive force, are automatic, mechanical, or mixed.

4. Mechanical and mixed extension should be fixed upon that portion of the bone belonging to the less cumbrous, most mobile portion of the limb; counter-extension should be applied to that portion which is firmest and least mobile.

5. The method employed to produce fixation of both portions of the limb should be comfortable and such as will do no injury to the member, and should never extend beyond the limit of the segment upon which they have their points of resistance.

6. In solution of continuity, the point of fracture, and in arthritic disease, the interarticular line, is always the limit and centre of the forces applied for extension.

7. The force of traction must be proportionate to the resistance to be overcome and regulated, so as to render possible an estimate of its absolute power and of the effect produced.

8. The only traction of real value is that employed to overcome constant resistance; any force applied to overcome accidental resistance is entirely futile.

9. The inevitable resistance is represented by muscular tonicity and the elasticity of the teguments; accidental resistance has for its factors diverse elements, among which the principal ones are friction of the segments upon the bed and apparel, and the action of gravity upon these same segments resting upon an inclined plane.

10. The accidental resistance must be annulled or decreased to a minimum, and the mobile segment submitted to extension regulated in such a manner that the influence of gravity may be beneficial or its ill effect entirely obviated.

11. The application of extension and counter-extension to the segments of an injured limb is habitually mediate and rarely immediate; that is to say, that the forces applied generally take their points of resistance upon levers contiguous to those employed to produce motion or immobilization.

12. To direct and scientifically employ an apparatus for extension it is necessary to know the value in force: 1, of the motor force; 2, of the force transmitted to the mobile segment; 3, of the resistance to be overcome; 4, of the loss experienced by the force of extension; for it is indispensable that this last factor retain, after all loss of power from all causes whatsoever, sufficient efficiency to overcome inevitable resistance. Upon this point the efficiency of the apparatus depends.

13. The value in weight of accidental resistance is impossible to be established, and it is therefore necessary to suppress it or to reduce it to such an extent that it may be disregarded. The inevitable resistance in an adult, whatever may be the development of the muscles or the location of the fracture, may be estimated at between two and a half and nine pounds, and consequently the force applied to the bone of the movable segment, the efficient force should never exceed nine or be less than four and a half pounds. In the great majority of cases the weight required will be nearer the first extreme than the second.

14. Counter-extension, which should be rather mixed than purely automatic, and never exclusively mechanical, needs only to be employed with a force equal to the traction exerted upon the segment to be immobilized; if this is placed horizontally when the part rests upon a declined plane, the counter-extension being of necessity exerted against both the force of gravity and against the force of extension transmitted by the lax tissues which unite the segments, becomes absolutely imponderable.

15. In the majority of cases it is advisable not to permit the crural portion of the limb to remain completely free; a small trough will exercise direct pressure if it becomes necessary for any reason to adjust the fragments and retain them in position, and the conformation of the limb will be more regular, and the consolidation of the bone more perfect.

16. Apart from special indication the limb submitted to extension should never be placed upon an ascending inclined plane, but upon a plane either horizontal or slightly declined.

OPHTHALMOLOGY AND OTOLOGY.

On the Use of the Galvano-Cautery in Eye Diseases, especially in Destructive Processes of the Cornea.

Dr. A. Nieden, in the *Archives of Ophthalmology* for March, 1885, gives the following *résumé* of the conditions in which the galvano-cautery can be successfully employed in diseases of the eye:—

1. The use of the galvano-cautery is always indicated in affections of the cornea which take their origin in mycotic infection.

2. In such cases it gives the most thorough disinfection of the floor and edges of the ulcer, and, at the same time, stimulates the process of repair.

3. This process of repair is shown, almost at once, in the increased diffusion power of the corneal tissue, the clearing of the aqueous humor, dilatation of the pupil, and absorption of the hypopyon.

4. In most cases, also, it does away with the necessity of the corneal incision, because, when the evacuation of the contents of the anterior chamber is required, it can be effected by means of the heated loop. Above all, the cautery can be immediately resorted to when the malignant nature of the process is evident, and accords with the maxim, "Principiis obsta."

5. The operation causes but slight pain, no assistant is needed, anæsthesia is unnecessary, and the method is available in the treatment of patients at the polyclinics.

6. A rapid disappearance of the ciliary irritation is almost always observed. The duration of the healing process is considerably lessened. The final result gives a much less extensive and dense opacity of the affected corneal tissue than is found after the use of the other methods.

7. The mode of applying the heated galvano-caustic loop is exceedingly simple and easy to master.

Acute Glaucoma caused by Homatropine.

Dr. FRANK H. HODGES reports a unique case of acute glaucoma caused by homatropine. Although several cases of the kind caused by atropine have been recorded, there has not been a single instance resulting from the application of homatropine.

A remarkable point in the case is that the glaucoma supervened twenty-six hours after the instillation of the homatropine, when the maximum effect of the drug must have long passed off.

From the fact that the outbreak of glaucoma did not occur until twenty-six hours after the instillation of the homatropine,[1] Dr. Hodges is inclined to the opinion that the attack was not caused by the blocking up of the angle of the anterior chamber by the mechanical application of the periphery of the iris; but that straining of accommodation to do crochet work when the ciliary muscle was only partially paralyzed by homatrophine caused congestion of the whole ciliary region, and so obstructed the normal outflow from the eye.—*Archives of Ophthalmology*, March, 1885.

A New and Convenient Test for Color-Blindness.

Dr. RICHARD HILBERT, of Königsberg, proposes a new test for color-blindness, which is valuable inasmuch as it is very simple in theory and easy of application.

This method may probably be of use in the recognition of weakened or weak color-perception. He says probably, for, in the absence of any such cases, he is without experience in this respect.

The material which he has employed in the examination of the color-blind is changeable silk. It is extensively used, and may be obtained of any dealer in silk. The particular kind of this silk which we find most useful is the red and green changeable, in which sap-green and purple threads cross at right angles. This makes a glossy surface, which, according to the direction of the folds, appears in some places red and in others green, while, as the position of the piece is changed, there is a constant interchange and play of these two colors.

His conjecture that the red-green blind would not be able to properly name and place the colors of this silk was completely confirmed, even the color-blind who were expert in sorting colors being unable to do so. And, further, he thinks this method will prove to be convenient in the examination of large numbers as to color-sense, especially as it can be employed with artificial light. It is self-evident that the result in the case of those who have preceded shall not be known to those who come after in the examination.

The author has examined a number of color-blind persons by this method, and the result of the examination of a few intelligent ones is submitted. Their statements may be relied upon as truthful and accurate. The greater number of these gentlemen had been carefully examined before, and the result of their examination published.

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[1] Dr. Hodges usually finds that the effect of the homatrophine, used as above described, completely passes off in from twenty-four to twenty-six hours.

Dr. Hilbert, therefore, claims that from his experience, this test is not only convenient, but is certain; at all events, it appears to him to be the one which, for a preliminary examination of a large number, will consume the least time.

Changeable silk may be made so as to show blue and yellow, as well as red and green, and may be used to detect blue-yellow blindness as well. He has not had a case of this variety lately, and is, therefore, unable to furnish any data respecting it. The rarity of this form of color-blindness, however, would render the use of the blue-yellow test almost unnecessary.

An exhaustive bibliography is appended.—*Archives of Ophthalmology*, September and December, 1884.

Peroxide of Hydrogen in Suppurating Ears.

Dr. WILLIAM A. DAYTON says, relative to the use of peroxide of hydrogen in suppuration of the ear:—

A spray of a four per cent. solution of the peroxide has had an almost magical effect in a case of ozæna complicated with "proliferous" catarrh of the middle ears. It will be observed that the stronger solutions induce local anæsthesia often in a marked degree. This is certainly advantageous, not only in the event of operative interference, but also in doing rhinoscopic work; besides, I have noticed that cocaine acted more promptly after the mucous membrane had been cleansed with the peroxide.

The above is but a hint at the various applications of this agent, should it meet the expectations of interested workers.

Even though no curative results are obtained in the experience of others from the peroxide *per se*, it *will* be found to be a most marvellous cleanser; and, if cleanliness is *the* desideratum in middle-ear suppuration, then we have a servant *par excellence* in the peroxide of hydrogen.—*Archives of Otology*, March, 1885.

Perforation of the Mastoid Cells.

At a late meeting of the Royal Medical and Chirurgical Society, Mr. DALBY read a paper in which perforation of the mastoid cells is said to be necessary. It does not include the ordinary cases, where, after inflammation of the middle ear, the usual signs of abscess in the mastoid process with softening of the external plate of bone are present, as they are often met with, especially in children, and treated by a free opening. In some of the cases in this paper the external plate of bone was healthy, and yet there was pus in the mastoid cells. In others, although the external plate of bone was diseased, the matter took a circuitous route under the scalp, at one time into the temporal region, at another into the occipital region and along the muscles of the neck. Although in some cases the indications for perforating the mastoid cells included continuous pain in the mastoid region, œdema on deep and continued pressure, pain increased by the recumbent position, a high temperature and severe rigors, as already detailed in the contribution on "Diseases of the Mastoid Bone" (*Transactions*, vol. lxii.), cases of pus in the mastoid cells and healthy external plate of bone are now related from which one or more of these symptoms were absent. Although the external osseous plate is found to be healthy, the perforation should still be made if the constitutional symptoms point to the presence of pus within the bone. The operation is performed with a drill, which is provided with a stop to enable the precise depth of the perforation to be determined; thus, all risk of penetrating too deeply is avoided, and the operation is free from danger. Six cases were selected, each of which illustrated some point of importance. In one case the patient was comatose, but afterwards recovered. In two others the inflammatory process was prolonged for many months before the evidence of the presence of pus was conclusive. In another symptoms of infantile paralysis were present, and disappeared after perforation of the cells had given exit to pus. In another the pus not only passed forward under the temporal muscle, but towards the occiput under the splenius capitis and complexus muscles, and down the neck to a level with the thyroid cartilage. In conclusion, the author expresses his belief that perforation of the mastoid cells is more urgently and frequently required than the literature of the subject would lead one to infer.

The PRESIDENT said that he had seen many cases of fatal disease of the brain caused by disease of the internal ear, which might possibly have been prevented by the apparently trivial operation advocated by Mr. Dalby.

Mr. URBAN PRITCHARD said that the commonest cases were those in which the pus was superficial to the mastoid cells. Suppurative disease of the mastoid cells may exist, and not even œdema or any sign, with the exception of tenderness on percussion, need be present to indicate the presence of the disease. The operation was a simple one. Wounding of the lateral sinus was possible if care were not taken. In one case he had opened the mastoid cells and found them empty, even though marked symptoms, like unilateral flushings with epileptiform fits, were present; strange to say, the fits and other symptoms subsided after the apparently unsuccessful operation.

Mr. W. HAWARD said that, if the records of a hospital were searched, evidence would be found of the frequency with which large numbers of cases are admitted on account of convulsions, coma, delirium, and affections of the pyæmic class, proving rapidly fatal, and due to suppuration of the mastoid cells. It was very important to recognize the symptoms which call for the operation. Some surgeons have urged that a route already exists by which matter can make an exit, but the communication between the tympanum and the mastoid cells was very small, and, as a matter of fact, the pus does not escape in the fashion supposed. The tendency of pus to burrow in many directions was also another reason for surgical interference and the establishment of a direct opening into the mastoid cells.

Mr. HOWARD MARSH, in his experience at the Hospital for Sick Children, could bear testimony to the statements of Mr. Dalby and Mr. Haward. He related two cases in which the patients were insensible, and which made good recoveries after the operation of opening the mastoid cells had been performed. The danger of wounding the venous sinuses was a real one, and he remembered to have had to use great care in trephining for depressed fracture of the skull; in one case the longitudinal sinus, and in another the lateral sinus, had to be carefully avoided.

Mr. DALBY, in reply, said that the mastoid cells did not always communicate sufficiently freely to allow of free drainage when one of their number was fully opened. In America the use of the chisel and hammer had recently been advocated, but this would be an outrageous procedure.—*Lancet*, Jan. 31, 1885.

MIDWIFERY AND GYNÆCOLOGY.

Reciprocal Influence of Epilepsy and Pregnancy.

Notwithstanding numerous works upon this subject, the question still presents many points of obscurity. Dr. RAOUL BÉRAUD, in a thesis upon the Reciprocal Influence of Epilepsy and Pregnancy, published in the *Journal de Méd. et de Chirurg. Prat.*, refutes two widely-spread errors: the pretended necessity to the fœtus of bromide of potassium administered to a pregnant epileptic; and the more or less mysterious curative influence of marriage upon epilepsy. Analysis of a large number of cases shows in the first place that pregnancy occurring in an epileptic has a very variable influence. In certain cases this influence is unfavorable, in others it is *nil*, and in a great number favorable in the sense that during pregnancy the attacks are frequently suspended or diminished in their intensity. This is, however, entirely transient, as after confinement the epilepsy resumes its usual course.

The transient beneficial influence does not justify marriage, owing to the serious objections which overbalance the apparent improvement. It is proven that copulation exercises a markedly unfavorable influence upon epileptics and aggravates their condition; and further, the danger of heredity of the disease in children of itself contraindicates marriage.

As to the influence of epilepsy upon pregnancy it appears generally to be of little importance. The attacks sometimes are increased to the point of being persistent without effect upon the gravid uterus. Abortion or premature labor is never produced. If in the first pregnancy the attacks are suspended, the same result occurs at each succeeding pregnancy. Bromide of potassium is generally beneficial to the mother, and M. Béraud has never observed a deleterious effect upon the development of the fœtus even when three drachms daily were administered.—*L'Abeille Médicale*, Jan. 19, 1885.

The Advantages of Abdominal Support during Pregnancy.

Dr. ALEXANDER DUKE, of Dublin, in suggesting the employment of abdominal support during pregnancy, says: Every obstetrician of fair experience must have met with cases, however well cared for during and after confinement, who still suffered from "pendulous abdomen," or want of tone in the abdominal muscles; the said want of tone being often conducive to ventral hernia, constipation of the bowels, and also displacement of the uterus. As a rule, patients during the whole term of pregnancy wear their corsets; and, however they may loosen or adjust the same, still the downward pressure of the corset acts in a contrary direction to the uterus, which, from the earliest months, raises itself upwards towards the diaphragm, and continues to move in the upward direction, till the full term of pregnancy is completed. Knowing this to be the case, I always advise patients, in a pregnant condition, to leave off their corsets (from about the fourth month onward, should I see them at that time), and having supplied the want of corset by a suitable bodice, to wear a supporting abdominal belt with elastic sides, so as to exercise a comfortable pressure from below on the muscles, and fitted with tapes or straps, to relax the pressure as the uterus enlarges.

In every case in which I have recommended this to be done, and where my directions were followed, the patient not only expressed herself as feeling far more comfortable, but I have remarked that the subsequent labor was of much shorter duration, owing, I believe, to the support afforded in time to the abdominal muscles, and which, by husbanding their tone and strength, enabled them to assist the uterus in its efforts of expulsion in a marked degree.

When engaged to attend primiparæ, I also direct the bandage to be left off at night, and the abdomen well rubbed over with fresh lard at bed-time. When this treatment is followed in primiparæ, I find there is little or no trace of the lineæ albicantes to be discovered after the patient recovers from the lying-in, and the abdomen also resumes its natural appearance, which the patient, as a rule, is the first to remark.—*Brit. Med. Journ.*, March 7, 1885.

Extra-uterine Pregnancy; Recovery.

Dr. BOUZOL presented to the Medical Society of Lyons, in December last, a remarkable case of uterine pregnancy. The woman was thirty-eight years old, the mother of six children, and had never had any complications in her previous pregnancies. She was last confined in 1881, and since that time to July, 1883, when she began again to experience some of the symptoms of pregnancy, had never menstruated.

About the ninth month of the supposed pregnancy, she experienced for many days symptoms of labor, but accouchement did not result, only the expulsion of some blood and clots from the vagina taking place. All pains having ceased, the woman, notwithstanding the great size of her belly, resumed her accustomed occupations, till at the end of about fifteen days, a liquid, at first transparent but afterwards mingled with pus, began to trickle from the umbilicus. The distension of the abdomen increased, and extra-uterine pregnancy was diagnosticated. No operative measures were resorted to, however, and medication was confined to anodynes. Within a few days fistulas appeared spontaneously a little below and to the left of the umbilicus, and finally united in one large opening, sufficient to permit the escape of the skeleton and the constituent parts of the fœtus mixed with sanguinolo-putrid fluid and decomposed tissue.

Notwithstanding the omission of operative interference, and the failure to use antiseptic irrigation in the suppurating cavity, and the neglect to enlarge the fistulous orifice to allow the better escape of the putrefying products, cure was complete.

The woman, contrary to advice, insisted on resuming her household duties, notwithstanding the persistence of the abdominal opening, which had not yet healed. Accordingly, on making effort to rise, a mass of intestines escaped through the opening. She did not, however, call her physician for three days, and on his arrival he found a strangulated hernial tumor, and already so altered by exposure to the air that no attempt was made to return it into the abdominal cavity. Necessity compelled the forming of an artificial anus; but the operation was done with little hope of success. The pulse was imperceptible, the extremities cold, the features unnatural and discomposed, and the general condition weak. Contrary to expectation, the patient again recovered. After a month the artificial anus was notably retracted, and the lower end of the bowel began to resume its function. At the time of this report the artificial anus had completely healed.—*Revue Médicale*, January 24, 1885.

Concerning the Cause and Avoidance of Corrosive Sublimate Poisoning in Obstetrical Irrigation of the Uterus and Vagina.

Dr. OTTO VON NERFF, in a paper upon the cause and avoidance of poisoning from the use of corrosive sublimate solution in obstetrical procedures, reaches the following conclusions:—

1. It is safe to affirm that the vagina, whether it be from the contraction of the musculus constrictor cunni, or of the levator ani, sometimes occasions the detention of a considerable quantity of the injected fluid.

2. Symptoms of intoxication, after obstetrical irrigation of the vagina or uterus, is occasioned for the most part by absorption of the injected fluid by the mucous membrane of the vagina, since the uterus, after injection, soon constricts firmly, and, consequently, the danger of absorption through its walls is reduced to a minimum.

3. Absorption through the vagina is only possible if the disinfecting fluid is retained a considerable period, especially if during its retention there is a coexisting increase of pressure in the vagina, which condition does not obtain at the time of injection.

4. It is probable that, in most of the literature of the recorded cases, the absorption of the fluid was principally by the vagina, in two cases especially, vaginal irrigation only having been resorted to.

5. Direct entrance of the corrosive solution into the abdominal cavity, and even into the blood current itself, naturally results from retention of the fluid incident to increased pressure in the vagina from contracture of its walls, or when such an unfavorable condition as unusual patulency of the Fallopian tubes exists. This occurrence is rare, however, and can only happen after imperfect escape of the irrigating fluid.

6. In all vaginal and intra-uterine irrigation with corrosive sublimate solution, it is always necessary to use all precautions possible to procure free escape of the fluid, in order to avoid its retention in the uterus, and especially in the vagina, where the danger is greatest, owing to the possibility of an increase of pressure by contraction of the vaginal walls.

To diminish still further the danger of sepsis to the lying-in, Dr. Nerff recommends the following precautions:—

1. Careful disinfection of the physician, the midwife, and attendants.

2. At the beginning of labor, careful washing of the external genitals with weak corrosive sublimate solution, and clipping of the hair of the pubes.

3. In the course of normal labor, prophylactic irrigation of the vagina is unnecessary. When there is suspicion of a possible infection on the part of the midwife, or of beginning decomposition of the secretions during the course of a tedious labor, vaginal irrigations with a weak corrosive solution of 1 to 5000 or 1 to 3000 are indicated.

4. After normal accouchement, prophylactic uterine irrigation is superfluous. In special conditions only, *i. e.*, after the introduction of the hands into the uterus, or if processes of decomposition from any cause have arisen in utero, or the product of conception be dead and putrefying, the uterus at the end of labor should be disinfected with weak corrosive sublimate solution, of the strength above designated.

5. In normal child-bed after normal labor, sublimate irrigation is unnecessary, and under certain circumstances may be harmful. Nevertheless, such injection is not to be dispensed with if it be probable that by the use of a weak corrosive solution possible infection may be avoided. On the other hand, in puerperal diseases which require intra-uterine treatment, corrosive sublimate irrigation of the genital passages with mild or strong solution is indicated and usually followed with immediate good results.

6. Of the stronger corrosive solutions, especially of the 1 to 1000 solution, it is necessary only to make use on the ground of special indications, *i. e.*, on the occurrence of dangerous septic puerperal fever.

7. In all irrigations by corrosive sublimate, vaginal and intra-uterine, with weak or strong solutions, the following rules are to be strenuously observed:—

a. Only small quantities of the irrigating fluid are to be used, one, and at the highest, two quarts.

b. Irrigation should be concluded as quickly as possible.

c. Pre-eminently, during and after irrigation, free exit of the fluid must be maintained, in order to avoid the evil effects of retention and elevation of pressure indicated above. This is especially to be attended to in cases of apparent free exit of the fluid.

8. In atony of the uterus, as well as in extensive wounds of the genital passages, irrigation by corrosive sublimate solution is entirely contraindicated; also, as in anæmic individuals and in those suffering from kidney affections, if it is possible to omit them; and in women who at any previous period have been in any manner treated with mercury, they are to be used with special care.

9. Commonly, it is the duty of the physician himself to use the sublimate injections, at least in all cases in which it is necessary to apply the intra-uterine and stronger solutions; skilful midwives can administer the weaker injections in cases of necessity. The strongest solution that should be intrusted to these is that of 1 to 5000.

10. For the application of the irrigations, such apparatus only is to be used which, through height of its fall, insures a continuous stream of the fluid, for which is only required a pressure height of about twenty-six inches. The greatest care is to be exercised for the absolute cleanliness of the instruments, and of the surroundings generally.—*Archiv für Gynækologie*, vol. xxv. p. iii., 1885.

Surgical Intervention in Small Tumors of the Ovaries and Uterus.

Dr. PÉAN, in vol. iv. of the *Surgical Clinics of the Hospital St. Louis*, concisely states his opinions relative to surgical intervention in small tumors in the uterus and ovaries. He says: There is a certain number of tumors of the ovaries which necessitate the ablation of these organs before the tumor has attained any considerable size. To this class belong those dependent upon certain forms of chronic inflammation cysts, fibromata and cancer. Generally the surgeon is forced to interfere on account of nervous manifestations—particularly those of neuralgia, and owing to mental affections resulting from the disease. M. Péan absolutely rejects the whole series of indications cited by foreign surgeons, as authorizing the castration of women, and holds that it is not permissible to perform the operation to arrest hemorrhage resulting from the presence of uterine tumor.

In reference to small tumors of the uterus, he advises partial ablation when sufficient to remove the tumor and pass the limits of the disease, if cysts or pediculated fibrous tumors are present; excision with the bistoury or galvano-cautery or extemporaneous ligature is recommended according to the indications of the case, or the special advantages afforded by either of the procedures.

In cases of epithelial cancer, the partial ablation with the cutting cautery of his own invention is recommended by the writer, even when between the cervix and the vaginal cul-de-sac it is necessary to destroy the interior of the body of the uterus.

If there exist small fibrous tumors of the uterus which imperil the life of the patient, partial supra-pubic ablation is recommended, especially if they are in relation with the hypogastrium and umbilical region, when the method is sufficient to exceed the limits of the disease. When it fails to accomplish this, total ablation of the uterus should only be attempted by this method in exceptional instances.

If there exist a number of small fibromata of the uterus, which are dangerous to life, but by reason of their number, small size, and location, are difficult of access by the hypogastric method of operation, and can only be cured by the total ablation of the uterus, their removal is best accomplished by the vaginal method recommended by M. Péan.

In ablation of the uterus *per vaginam*, it is not necessary to remove the ovaries along with that organ, if they are not diseased. In case they require removal, the gravity of the operation will not be sensibly increased.

When the uterus is affected with epithelial cancer, total ablation has not hitherto afforded as good results in cases in which the neoplasm was limited to the neck of the organ as when it was confined to the mucous membrane of this body. In this case partial ablation with the cutting cautery has been of incomparable benignity.

In cases where the body of the uterus is profoundly affected, the danger of sudden death and the promptitude of return render intervention as perilous as useless, and total ablation to-day, so vaunted in tumors of this kind, rarely finds an application.—*Revue Médicale*, May 16, 1885.

Uterine Hæmatocele.

Dr. G. BERNUTZ, at the conclusion of an elaborate discussion of the origin of uterine hæmatocele, appends the following *résumé*:—

1. Uterine hæmatocele (peculiar to the feminine sex) or peri-uterine cannot, in point of view of general pathology, be considered as a distinct and special disease. It constitutes simply an anatomo-pathological entity which may produce a great number of maladies, and various morbid conditions. It is, therefore, indispensable to limit exactly the subject in order that it be not too complex, as a result of which the pathological history of this morbid entity would only be confused.

2. The term *uterine* or *peri-uterine hæmatocele* should for this cause be limited exclusively to designate pelvic sanguineous tumors contiguous to the uterus, and not true uterine tumors which have for their location the peritoneal cavity itself. *It is important:* 1. To restore to cases to which the name hæmatocele or extra- or sub-peritoneal has been applied, the denomination of thrombus of the cellular tissue of the broad ligaments and of the vagina, which accoucheurs have limited to cases of this nature observed in the puerperal state. 2. To apply the name pseudo-hæmatocele to pelvic hæmatomata in which the sanguineous extravasation is not, properly speaking, contained in the peritoneal cavity itself, although it may either be inclosed in an extra-uterine abdominal fœtal cyst (Huguier) or it may be extra-neo-membranous, as in the cases which have served as the foundation for Virchow's theory.

3. The term "uterine hæmatocele," as indicated by the derivation of the word hæmatocele, *αιμα κήλη*, should be applied only to sanguineous intra-peritoneal collections which form tumors perceptible to abdominal palpation and touch; that is to say, those which are encysted. The term cannot be legitimately applied to sanguineous collections which are free in the peritoneal cavity, which, therefore, dissipate under pressure of the hand practising palpation and under that of the finger employed for the touch, and which thus do not give the sensation of resistance characteristic of a pure tumor. Observations of this last variety constitute a distinct order of cases which should be described separately under the name of internal abdominal hemorrhage which our predecessors have given to them. It is only on this condition that the confusion caused by the irrational fusion of the two distinct varieties of cases can be remedied.

4. It follows accordingly, without prejudging the interesting question raised by the results of experiments performed on animals by M. Poncet: That a uterine hæmatocele must necessarily require two factors in order to exist—intra-

peritoneal pelvic hemorrhage and the partitioning of the cavity of the pelvis. These may be, *vice versa*, the cause of each other, or arise at entirely distinct periods. There are, therefore, two or rather three, distinct modes in which uterine hæmatocele may be formed. In the last two modes of formation which give rise to common hæmatoceles, the hemorrhage producing the hæmatoma is produced secondarily to the partitioning of the cavity of the pelvis. In the third mode, which is the most frequent of all, the hæmatoma immediately follows upon an acute pelvic peritonitis, which is the direct cause of the sanguineous extravasation.

5. The first mode of formation which has been recognized for many years, and which during all this time no one has thought of questioning—so natural does it appear—should to-day be considered as exceptional. In the first mode of formation which has served as the basis of all French theories upon the origin of these sanguineous tumors, the hæmatocele has as an initial factor, an intra-peritoneal pelvic hemorrhage, which secondarily excites an encysting peritonitis. In cases of this kind in which the pelvic cavity and the abdominal cavity, properly speaking, are in free communication, and in which accordingly the vascular tension, which is the immediate cause of hemorrhage, is not equalized by the resistance of the walls of the cavity to be distended, the sanguineous extravasation by its abundance generally gives rise to the violent accidents which characterize internal abdominal hemorrhages. The existence, in these cases, of violent complications which necessitate almost constantly an unfavorable prognosis in a short time on account of excessive loss of blood, the development of a rapidly fatal general peritonitis, or the appearance of grave functional trouble produced by the pressure of an enormous hæmatoma, which is a result of the hemorrhage, indicates, as has already been said, the separation of this class of cases from pure uterine hæmatocele, since they are not distinguished from other internal abdominal hemorrhages except in the fact that some steps toward their treatment, though generally futile, are indicated, which in the other cases are altogether absent.

6. In the second mode of formation there is, on the contrary, before the existance of pelvic intra-peritoneal hemorrhage, a partitioning of the basin of the pelvis, which has formed for a greater or less time a closed cavity from which it results that the sanguineous excavation which has accumulated therein is only moderate in quantity, and gives, accordingly, a benign symptomatology in comparison with that of the violent hæmatoceles. This diversity in the progress of the two factors of hæmatocele makes in practice two orders of cases entirely distinct from each other, although there sometimes occurs hemorrhage of similar nature, *e. g.*, symptomatic of the rupture of the ovary, the product of which is sometimes directly inclosed in the basin of the pelvis and sometimes more or less diffused in the abdominal cavity. The marked dissimilarity in the two cases resulting from the limitation, restricted or non-restricted, of the space involved by the flux, and consequently of the sanguineous extravasation, makes plain the similarity, if not complete at least very great, in the symptomatology of intrapelvic hemorrhage whatever be its cause, whose product is encysted, as was said before in a cavity closed for a longer or shorter time. In the second mode of formation, which in this respect resembles the first, the causal hemorrhage of the hæmatoma is symptomatic either of a lesion of the ovary (ovarian hæmatocele) or of atresia, congenital or acquired, complete or incomplete, hæmatocele by menstrual retention, or of an increase of the secretion arising from the internal genital organs (metrorrhagic hæmatocele), or of an active neo-membranous congestion. Hæmatocele symptomatic of a hemorrhagic patchy-pelvic congestion supervening suddenly generally upon a menstrual period or after difficulty in menstruation in those women of apparently good health, or as a consequence

of a hemorrhagic diathesis, and the hæmatocele is accordingly established permanently. In two of the varieties which recognize this second mode of formation, to which Trousseau has applied the collective title of catamenial, there exists a special characteristic anatomical disposition shown by autopsy to consist of a sanguineous expletion of either of the two Fallopian tubes or of the oviducts only, an anatomical disposition which is wanting in all other varieties, and destroys all exclusive theories of the formation of uterine hæmatocele.

7. In the third mode of formation in which, previous to the causal hemorrhage of the hæmatoma, there most frequently exists a partitioning of the cavity of the pelvis of recent or remote origin, but which may be incomplete or absent, the hemorrhage originating the hæmatoma follows upon the occurrence, or sometimes upon the decline, of subacute pelvic peritonitis—which constitutes a phase antecedent to the hemorrhage by forming preparatory to its formation the multiplication of new vessels in the peritoneum. The sanguineous extravasation furnished in these cases by the new membranes which cover the pelvic peritoneum is symptomatic of a subacute pelvic peritonitis very frequently menstrual, which forms an intermediate bond between menstrual derangement and the development of uterine hæmatocele. This in general supervenes upon a catamenial period as a recrudescence of inflammatory pelvic symptoms; it is at the onset of considerable volume and immediately perceptible, and reveals ultimately the progress and sequelæ of common hæmatocele. Thus this species of hæmatocele is much the most frequent of all, because in the greater number of hæmatoceles which arise from menstrual disturbance the disordered function does not immediately give rise to a hæmatoma—as has been thought, even up to the work of M. J. Besnier—but excites simple pelvic peritonitis, under the influence of which the causal extravasation of the sanguineous tumor will secondarily result, a process which does not agree at all, as I have long argued, with the theory of Virchow.

8. The very exceptional conditions which agree with that theory constitute an affection entirely distinct from uterine hæmatocele with which these intra-neomembranous hæmatomata have only a distant relation, because, 1, they have as an initial factor a special chronic hemorrhagic inflammation of the pelvic peritoneum, and most frequently is located upon that portion of the peritoneum which invests the posterior wall of the uterus. 2. A slow mode of formation which is also chronic and intermittent. 3. An obscure symptomatology which up to the present time is unsettled. 4. Finally they have as an anatomical peculiarity a special constitution identical with that of meningeal hæmatomata symptomatic of pachymeningitis, and which is entirely distinct from that observed in uterine hæmatocele, properly so called, in which the extravasation has for its location the peritoneal cavity which is itself covered with a false membrane. Unfortunately, the pathological history of that affection, which in the feminine sex appears to be analogous to the hæmatocele of the *tunica vaginalis* in man, remains almost completely unwritten and will require prolonged research which I am unable to undertake.—*Archives de Tocologie*, May, 1885.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

Iodoform Poisoning.

Prof. HARNACK and Dr. E. SCHWARZ, of Halle, record, in the *Berliner klin. Wochenschrift* (Feb. 16, 1885), four cases in which serious, and in two cases fatal symptoms appeared during the use of iodoform as a dressing after operations on the vagina. In no case was the quantity used large, but each patient had been the subject of psychical disturbances prior to the performance of the operations.

The symptoms all pointed to irritation of the higher cerebral centres, convulsions being present in all cases, and in the fatal ones violent mania was the most prominent symptom. The symptoms appeared on the second or third day after operation, and seem to have come on quite suddenly. In the two fatal cases the irritation symptoms gave place to collapse, in which the patients died; one five days after operation, the other on the third day.

Prof. Harnack made careful analyses of the urine in two of the cases reported, and from the results of these analyses, and of others made by Dr. Gründler, he states that when iodoform was used as a dressing and no symptoms of poisoning occurred, the iodine was excreted by the kidneys as an iodide, whereas in the cases in which there were symptoms of poisoning, the greater part of the iodine excreted was found combined with organic substances, which were probably the result of the decomposition of an iodine-albumin compound.

The results of the analysis of the urine and organs of one of the fatal cases are given below: On the first day after the appearance of cerebral symptoms the total amount of iodine was 0.5277 grm. per litre of urine (= 0.6906 grm. KI), four-fifths of this iodine being in organic compounds. On the second day, all iodoform having been removed from the wound. in the vagina, no iodides were detected in the urine; but the organic residue contained iodine compounds equivalent to 0.1035 of iodine per litre of urine.

In the ashes of the liver substance no iodine was found. In those of the cerebrum, a trace of iodine was present, but there was not enough to weigh. In the dried substance of the cerebellum 0.0203 per cent. of iodine was found.

Prof. Harnack remarks on the large proportion of iodine found in the brain, and thinks that this will account for the preponderance of cerebral symptoms in these cases.

In the second case, which was not fatal, analysis of the urine showed 0.2318 grm. of iodine per litre, three-fourths of which was present as iodides; the total amount of iodine in the urine being much greater than in the fatal case, whilst the relative amount of iodide is four times as great, thus supporting Prof. Harnack's hypothesis as stated above.

The practical outcome of these papers is as follows:—

Iodoform must be used very sparingly as an antiseptic for wounded surfaces. The authors recommend that free iodoform be not used, but that iodoform gauze should take its place. Great care should be exercised if iodoform is used for patients who have previously suffered from mental disturbances.

On the first appearance of any cerebral disturbance after the use of the drug, the wound must be well cleaned and washed with alkaline lotions, and large doses of acetate of potash given by the mouth; and, in the most serious cases, transfusion of alkaline salt solutions into the veins is recommended as worthy of a trial, so as to assist the excretion of iodine from the blood, or to convert it into harmless iodides.—*The Medical Chronicle*, May, 1885.

University of the City of New York,

MEDICAL DEPARTMENT.

410 East Twenty-sixth St., opp. Bellevue Hospital, New York City.

FORTY-FIFTH SESSION, 1885-86.

FACULTY OF MEDICINE.

REV. JOHN HALL, D.D., LL.D., *Chancellor of the University.*

ALFRED C. POST, M.D., LL.D., Professor Emeritus of Clinical Surgery; President of the Faculty.

CHARLES INSLEE PARDEE, M.D., Dean of the Faculty; Professor of Otology; Surgeon to the Manhattan Eye and Ear Hospital.

J. W. S. ARNOLD, M.D., Professor Emeritus of Physiology and Histology.

JOHN C. DRAPER, M.D., LL.D., Professor of Chemistry and Physics.

ALFRED L. LOOMIS, M.D., LL.D., Professor of Pathology and Practice of Medicine; Physician to Bellevue Hospital.

WILLIAM H. THOMSON, M.D., Professor of Materia Medica, and Therapeutics; Diseases of the Nervous System; Physician to Bellevue Hospital.

J. WILLISTON WRIGHT, M.D., Professor of Surgery; Surgeon to Bellevue Hospital.

WM. MECKLENBERG POLK, M.D., Professor of Obstetrics and Diseases of Women and Children; Physician to Bellevue Hospital, and to Emergency Lying-in Hospital.

LEWIS A. STIMSON, M.D., Professor of Anatomy; Professor of Clinical Surgery; Surgeon to Bellevue Hospital; Curator to Bellevue Hospital.

——— ——— ——, Lecturer on Physiology.

STEPHEN SMITH, M.D., Professor of Clinical Surgery; Surgeon to Bellevue Hospital.

A. E. MACDONALD, M.D., LL.B., Professor of Medical Jurisprudence and Diseases of the Mind; Medical Superintendent of the New York City Asylum for the Insane.

HERMAN KNAPP, M.D., Professor of Ophthalmology; Surgeon to the Ophthalmic Institute.

S. OAKLEY VANDERPOEL, M.D., LL.D., Professor of Public Hygiene.

FANEUIL D. WEISSE, M.D., Professor of Practical and Surgical Anatomy; Surgeon to Workhouse Hospital, B. I.

R. A. WITTHAUS, M.D., Professor of Physiological Chemistry.

HENRY G. PIFFARD, M.D., Clinical Professor of Dermatology; Surgeon to Charity Hospital.

F. R. S. DRAKE, M.D., Clinical Professor of Medicine; Physician to Bellevue Hospital and to Emergency Hospital.

JOSEPH E. WINTERS, M.D., Clinical Professor of Diseases of Children.

N. M. SHAFFER, M.D., Clinical Professor of Orthopædic Surgery; Surgeon to New York Orthopædic Hospital.

P. A. MORROW, M.D., Clinical Professor of Venereal Diseases; Surgeon to Charity Hospital.

WM. C. JARVIS, M.D., Clinical Professor of Laryngology.

H. P. LOOMIS, M.D., and S. C. BLAISDELL, M.D., Demonstrators of Anatomy.

THE PRELIMINARY SESSION will begin on Wednesday, September 16, 1885, and end September 30, 1885. It will be conducted on the same plan as the Regular Winter Session.

THE REGULAR WINTER SESSION will begin September 30, 1885, and end about the middle of March, 1886. The plan of Instruction consists of Didactic and Clinical Lectures, Recitations, and Laboratory work in all subjects in which it is practicable. To put the Laboratories on a proper footing a new building has been erected at an expense of forty thousand dollars.

UNIVERSITY BIOLOGICAL AND PATHOLOGICAL LABORATORY.—The Faculty, aided by generous friends, have enlarged the New Laboratory Building and established a Biological and Pathological Laboratory in connection with its Laboratory of Chemistry and Materia Medica. It is furnished with all the apparatus for the study of Bacteriology, and for special lines of investigation.

Two to five Didactic Lectures and two or more Clinical Lectures will be given each day by members of the Faculty. In addition to the ordinary clinics, *special clinical instruction*, WITHOUT ADDITIONAL EXPENSE, will be given to the candidates for graduation during the latter part of the Regular Session. For this purpose the candidates will be divided into sections of twenty-five members each. All who desire to avail themselves of this valuable privilege must give in their names to the Dean during the first week in November. At these special Clinics students will have excellent opportunities to make and verify diagnoses, and watch the effects of treatment. They will be held in the Wards of the Hospitals and at the Public and College Dispensaries.

Each of the seven Professors of the regular Faculty will conduct a Recitation on his subject one evening each week. Students are thus enabled to make up for lost lectures, and prepare themselves properly for their final examinations without additional expense.

THE SPRING SESSION will begin about the middle of March and end the last week in May. The daily Clinics and Special Practical Courses will be the same as in the Winter Session, and there will be Lectures on Special Subjects by Members of the Faculty.

It is supplementary to the Regular Winter Session. Nine months of continued instruction are thus secured to all students of the University who desire a thorough course.

FEES.

For course of Lectures	$140 00
Matriculation	5 00
Demonstrator's Fee, including material for dissection . . .	10 00
Final Examination Fee	30 00

For further particulars and circulars address the Dean,

PROF. CHAS. INSLEE PARDEE, M.D.,
University Medical College, 410 *East 26th St., New York City.*

The Jefferson Medical College
OF PHILADELPHIA.

The Sixty-first Session of the Jefferson Medical College will begin on Wednesday, October 1st, 1885, and will continue until the end of March, 1886. Preliminary Lectures will be held from Wednesday, 16th of September.

PROFESSORS.

J. M. DA COSTA, M.D., LL.D.,
Practice of Medicine.

WM. H. PANCOAST, M.D.,
General, Descriptive, and Surgical Anatomy.

ROBERTS BARTHOLOW, M.D., LL.D.,
Materia Medica, General Therapeutics, and Hygiene.

HENRY C. CHAPMAN, M.D.,
Institutes of Medicine and Medical Jurisprudence.

SAMUEL W. GROSS, M.D.,
Principles of Surgery and Clinical Surgery.

JOHN H. BRINTON, M.D.,
Practice of Surgery and Clinical Surgery.

THEOPHILUS PARVIN, M.D., LL.D.,
Obstetrics and Diseases of Women and Children.

J. W. HOLLAND, M.D.,
Medical Chemistry and Toxicology.

WILLIAM THOMSON, M.D.,
Professor of Ophthalmology.

MORRIS LONGSTRETH, M.D.,
Lecturer on Pathological Anatomy.

The regular course of lectures by the Faculty embraces the whole medical curriculum. This course is supplemented by the lectures on special topics, and demonstrations of the Spring and Fall terms, respectively.

The Faculty invite the attention of the medical profession and students to their thorough system of practical Laboratory work. To each department of the regular curriculum there is appended a Laboratory Course, carried on in large and thoroughly equipped apartments in the College, by specially appointed Demonstrators, under the immediate direction of the Professor. In this way each candidate for the degree of M.D. is immediately and personally taught in Obstetrics and Gynæcology, Physical Diagnosis, Laryngology, Ophthalmology, Medical Chemistry, Pharmacy, Materia Medica and Experimental Therapeutics, Physiology, Histology and Experimental Physiology, and Minor Surgery, Bandaging, Operations on the Cadaver, etc., and in the Department of Medicine, "clinical conferences," and practical lessons in Physical Diagnosis. There are, we believe, no corresponding practical courses in any other Medical College in this country—not at least to the same extent and with the same variety and constituting a part of the regular curriculum.

This course of Instruction is *free of charge, but obligatory upon* candidates for the Degree, except those who have had such instruction and those who are Graduates of other Colleges of ten years' standing.

The Spring Course of Lectures begins early in April, and ends in June. There is no additional charge for this Course to matriculates of the College, except a registration fee of five dollars; non-matriculates pay forty dollars, *thirty-five of which, however, are credited on the amount of fees paid for the ensuing Winter Course.*

Desirable opportunities are afforded to graduates in Medicine for pursuing special courses, and for instruction in the recognized Specialties.

Clinical Instruction is given *daily* at the Hospital of the Jefferson Medical College throughout the year by Members of the Faculty, and by the Hospital Staff, and at the Pennsylvania and other Hospitals several times a week.

FEES.

Matriculation Fee (paid once)	$5 00
Ticket for each Branch (7) $20	140 00
Practical Anatomy	10 00
Graduation Fee	30 00
Fees for a full course of Lectures to those who have attended two full courses at other (recognized) Colleges—the matriculation fee, and	70 00
To Graduates of such Colleges, the matriculation fee and	70 00
To Dental Graduates the first course is $60, and the second is	100 00

To Graduates in Pharmacy the general ticket is $100 for each year.

☞ There are no Extra Fees.

The Annual Announcement, giving full particulars, will be sent on application to

ROBERTS BARTHOLOW, M.D., *Dean.*

Bellevue Hospital Medical College.

CITY OF NEW YORK.

SESSIONS OF 1885-86.

The Regular Session begins on Wednesday, September 23, 1885, and ends about the middle of March, 1886. During this Session, in addition to the regular didactic lectures, two or three hours are daily allotted to clinical instruction. Attendance upon two regular courses of lectures is required for graduation.

The Spring Session consists of recitations, clinical lectures and exercises, and didactic lectures on special subjects. This Session begins about the middle of March, and continues until the middle of June. During this Session, daily recitations in all the departments are held by a corps of Examiners appointed by the Faculty.

The Carnegie Laboratory is open during the collegiate year, for instruction in microscopical examinations of urine, practical demonstrations in medical and surgical pathology, and lessons in normal histology and pathology, including the study of the various bacilli. The laboratories are under the direction of Professors Janeway and Dennis, assisted by Drs. Herman M. Biggs, L. J. McNamara, and J. S. Thacher.

FACULTY.

ISAAC E. TAYLOR, M.D.,
Emeritus Prof. of Obstetrics and Diseases of Women and Children, and President of the Faculty.

FORDYCE BARKER, M.D., LL.D.,
Professor of Clinical Midwifery and Diseases of Women.

BENJAMIN W. McCREADY, M.D.,
Emeritus Professor of Materia Medica and Therapeutics.

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Prof. of the Principles and Practice of Medicine, and Clinical Medicine.

FREDERIC S. DENNIS, M.D.,
Professor of Principles and Practice of Surgery and Clinical Surgery.

LEWIS A. SAYRE, M.D.,
Professor of Orthopedic Surgery and Clinical Surgery.

ALEXANDER B. MOTT, M.D.,
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WILLIAM T. LUSK, M.D.,
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A. A. SMITH, M.D.,
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Professor of Physiology and Physiological Anatomy, and Secretary of the Faculty.

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FEES FOR THE REGULAR SESSION.

Fees for Tickets to all the Lectures, Clinical and Didactic	$140 00
Fees for Students who have attended two full courses at other Medical Colleges, and for Graduates of other Medical Colleges	70 00
Matriculation Fee	5 00
Dissection Fee (including material for dissection)	10 00
Fee for the regular course of instruction at the Carnegie Laboratory	15 00
Graduation Fee	30 00

No Fees for Lectures are required of third-course Students who have attended their second course at the Bellevue Hospital Medical College.

FEES FOR THE SPRING SESSION.

Matriculation (Ticket valid for the following Winter Session)	$5 00
Recitations, Clinics and Lectures	40 00
Dissection (Ticket valid for the following Winter Session)	10 00

For the Annual Circular and Catalogue, giving requirements for graduation and other information, address Prof. Austin Flint, Jr., Secretary, Bellevue Hospital Medical College.

University of Pennsylvania.

DEPARTMENT OF MEDICINE.

Thirty-Sixth Street and Woodland Avenue, Philadelphia.

One Hundred and Twentieth Annual Session, 1885-86.

Students who have not received a collegiate degree, or who do not present the evidence of previous education referred to in the Catalogue, are required to pass a preliminary examination in English and Physics, for details of which see Catalogue.

Attendance is required upon three winter courses of graded instruction, seven months in duration, and consisting of didactic lectures, *daily* clinical lectures, and practical work in laboratories and hospitals.

A VOLUNTARY FOURTH YEAR, almost purely practical, has been established, for particulars of which see Catalogue.

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ALFRED STILLÉ, M.D., LL.D., Theory and Practice of Medicine, Emeritus.

HARRISON ALLEN, M.D., Physiology, Emeritus.

JOSEPH LEIDY, M.D., LL.D., Anatomy.

RICHARD A. F. PENROSE, M.D., LL.D., Obstetrics and Diseases of Women and Children.

D. HAYES AGNEW, M.D., LL.D., Surgery and Clinical Surgery.

WILLIAM PEPPER, M.D., LL.D., Theory and Practice of Medicine, and Clinical Medicine.

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The Preliminary Course will begin on Monday, September 14th.

In the *Spring Months* The Laboratories of Chemistry, Histology, Physiology, and Pathology are open, and clinical instruction is continued

FEES IN ADVANCE.—Matriculation $5. For each Session, including dissection, operating, and bandaging, $150. No graduation fee.

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JAMES TYSON, M.D., SECRETARY,
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* Dr. Reichert will give the course on Physiology for the Session 1885-6.

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The next annual session of this Department, now in the fifty-second year of its existence, will begin on Monday, October 19th. 1885, and end on Saturday, March 27th, 1886. The first four weeks of the term will be devoted exclusively to Clinical Medicine, Surgery, Obstetrics, and Gynæcology in the wards and amphitheatre of the Charity Hospital; to practical Chemistry in the Chemical Laboratory; and to practical Anatomy in the spacious and well-ventilated anatomical rooms of the University.

The means for practical instruction are unsurpassed in the United States, and special attention is called to the superior opportunities presented for

Clinical Instruction.

The Professors of the Medical Department are given, by a law of the State, the use of the great Charity Hospital, as a school of practical instruction. The Charity Hospital contains seven hundred beds, and, in 1884, admitted some eight thousand sick, besides furnishing treatment to more than ten thousand visiting patients. Its advantages for practical study are unsurpassed by any similar institution in this country. The Medical, Surgical, and Obstetrical Wards are visited daily by the respective Professors from eight to ten o'clock A. M., at which time all Students are expected to attend, and to familiarize themselves, *at the bedside of the patients*, with the diagnosis and treatment of all forms of disease and injury. Regular lectures are also given daily from 10 A. M. to 12 M. in the amphitheatre of the Hospital, either on Clinical Medicine or Clinical Surgery, or Pathological Anatomy, and this thorough course of practical clinical instruction is followed by the usual didactic lectures in the three ample lecture rooms of the Medical Department.

The administrators of the Charity Hospital elect annually, by competitive examination in March, fourteen Resident Students who are given boarding and lodging free of charge.

Terms.

For the Tickets of all the Professors	$140 00
For the Tickets of Practical Anatomy	10 00
Matriculation Fee	5 00
Graduation Fee	30 00

Candidates for graduation are required to be twenty-one years of age, to have studied three years, to have attended two courses of lectures, and to pass a satisfactory examination.

Graduates of other respectable schools are admitted upon payment of the Matriculation and half lecture fees. They cannot, however, obtain the Diploma of the University without passing the regular examination and paying the usual Graduation Fee.

As the practical advantages here afforded for a thorough acquaintance with all the branches of medicine and surgery are unsurpassed by those possessed by the schools of New York and Philadelphia, the same fees are charged.

For further information and circular, address

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Chicago Medical College.

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MEDICAL DEPARTMENT OF THE NORTHWESTERN UNIVERSITY.

SESSION 1885-86.

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This College was the first in the United States to adopt a graded system of instruction. All applicants for admission must possess at least a good English education, and present full evidence of the same. If an applicant has received the degree of A.B., or presents a certificate from some reputable Scientific School, High School, or Academy, no matriculation examination will be required; otherwise he must sustain a satisfactory examination before a committee of the Faculty. The students are divided into 1ST YEAR, 2D YEAR, and 3D YEAR CLASSES, instructions being given simultaneously in different lecture rooms.

The Clinical advantages of this College, with the great number of Dispensary, College Clinic and Hospital patients, cannot be surpassed. All professors of practical branches are members of the staffs of Mercy, St. Luke's, Michael Reese, Cook County Hospitals, and other charities. For several sessions each senior student has had the privilege of attending upon one or more obstetrical cases, and of witnessing important obstetrical operations.

It is the aim of the Faculty to make all instruction in the College pre-eminently practical.

FEES FOR COLLEGIATE YEAR, $75. Registration Fee, $5. Demonstrator's Ticket, $5. Laboratory Ticket, $5. Mercy Hospital Ticket, $6. St. Luke's Hospital Ticket, $5. Final Examination Fee, $30.

For the Annual Announcement and Catalogue, or for any information relating to the College, address

WALTER HAY, M.D., LL.D., Secretary,
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THE
AMERICAN JOURNAL
OF THE MEDICAL SCIENCES

FOR OCTOBER, 1885.

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TO READERS AND CORRESPONDENTS.

All communications intended for insertion in the Original Department of this Journal are only received for consideration with the distinct understanding that they are sent for publication to this Journal alone, and that abstracts of them shall only appear elsewhere subsequently, and with due credit. Gentlemen favoring us with their communications are considered to be bound in honor to a strict observance of this understanding.

Contributors who wish their articles to appear in the next number are requested to forward them before the 10th of October.

Liberal compensation is made for all articles used. Extra copies, in pamphlet form with cover, will be furnished to authors in lieu of compensation, *provided the request for them be written on the manuscript.*

The following works have been received for review:—

Ergebnisse der Behandlung von Hautkrankheiten mit Unna'schen Präparaten. Von Robert B. Morison, M.D., Professor in Baltimore.

Lehrbuch der Physiologie für Akademische Vorlesungen und zum selber-studium, Begründet von Rud. Wagner, fortgeführt von Otto Funke, neu herausgegeben von Dr. A. Gruenhagen, Professor der Medizin. Physik an der Universität zu Königsberg, siebente neu bearbeitete auflage mit etwa zwei hundert und fünfzig in der text eingedruckten holzschnitten, sechste lieferung. Hamburg und Leipzig: Leopold Voss, 1885.

Du Méchanisme de la Contraction Musculaire et ses rapports avec l'innervation du cœur et des vaisseux. G. M. Da Silva Jones, Lisboa, 1883.

De l'action antizymasique de quinine dans la fièvre typhoide, par G. Pécholier, Professeur Agrégé à la Faculté de Médecine de Montpellier. Paris: A. Delahaye et E. Lecroisuier, 1885.

Sull' Azione fisiologica e sul valore terapeutico dell' acqua amara Francesco Giuseppe di Buda-pest Recérche eseguite nella clinica, del Prof. A. Cantani dall assistence Dott. Alfredo Rubino. Estratto del Morgagni.

Il Vaccino Diffuso per il Dott. G. Guidi, Medico-Chirurgo pediatra a Firenza. Estratto.

Tratamento do Cholera, Artigo Cholera do Diccionario de Therapeutica de Gloner. Traducção e notas por G. M. Da Silva Jones. Lisboa: Typ. de Christovao Augusto Rodrigues, 1885.

Transactions of the Sei I Kwai, or Society for the Advancement of Medical Science in Japan. Tokyo, June, 1885.

Gout in its Clinical Aspects, or Outline of the Disease and its Treatment for Practitioners. By J. Mortimer Granville, M.D., M.R.C.P., Lond. London: J. & A. Churchill, 1885.

Gout and its Relation to Diseases of the Liver and Kidneys. By Robson Roose, M.D., F.R.C.P. Edin. London: H. K. Lewis, 1885.

Hunterian Lectures, 1885. The Anatomy of the Intestinal Canal and Peritoneum in Man. By Frederick Treves, F.R.C.S., Hunterian Professor at the Royal College of Surgeons, England. London: H. K. Lewis, 1885.

Tracheotomy in Laryngeal Diphtheria; After-treatment and Complications. By Robert William Parker, Surgeon to the East London Hospital for Children. Second edition, revised and considerably enlarged. London: H. K. Lewis, 1885.

The Middlesex Hospital Reports of the Medical, Surgical, and Pathological Registrars for the Year 1883. London: H. K. Lewis, 1885.

Contributions to Surgery and Medicine. The Collegians of 1666 and the Collegians of 1885; or, What is recognized Treatment? London: H. K. Lewis & Co., 1885.

Further Observations on the Treatment of Stone in the Bladder. By Reginald Harrison, F.R.C.S. of Liverpool, Surgeon to the Liverpool Royal Infirmary. Reprint. London: Balliere, Tindall & Cox, 1885.

Observations of Some Changes in Form of the Prostate and Floor of the Bladder, with eight illustrations. By Reginald Harrison, F.R.C.S., Surgeon to the Liverpool Royal Infirmary.

Introduction to a Discussion of the Diagnosis and Treatment of Tumors of the Bladder. By REGINALD HARRISON, F.R.C.S., Surgeon to the Liverpool Royal Infirmary.

Cholera; its Origin, History, Causation, Symptoms, Lesions, Prevention, and Treatment. By ALFRED STILLÉ, M.D., LL.D., Professor Emeritus of the Theory and Practice of Medicine in the University ot Pennsylvania. Philadelphia: Lea Brothers & Co., 1885.

A Text-Book of Physiology. By M. FOSTER, M.A., M.D., F.R.S., Prælector in Physiology, and Fellow of Trinity College, Cambridge. Third American from the Fourth and revised English edition, with extensive notes and additions by EDWARD T. REICHERT, Demonstrator of Experimental Physiology in the University of Pennsylvania, with two hundred and seventy-one illustrations. Philadelphia: Lea Brothers & Co., 1885.

Comparative Anatomy and Physiology. By F. JEFFREY BELL, M.A., Professor of Comparative Anatomy at King's College. Illustrated with 229 engravings. Philadelphia: Lea Brothers & Co., 1885.

Diseases of the Tongue. By HENRY T. BUTLIN, F.R.C.S., Assistant Surgeon and Demonstrator of Practical Surgery and Diseases of the Larynx, St. Bartholomew's Hospital. Illustrated with chromo-lithographs and engravings. Philadelphia: Lea Brothers & Co., 1885.

A System of Obstetric Medicine and Surgery, Theoretical and Clinical, for the Student and Practitioner. By ROBERT BARNES, M.D., Obstetric Physician to St. George's Hospital, and FANCOURT BARNES, Physician to the Royal Maternity Charity and to the British Lying-in Hospital. Illustrated with two hundred and thirty-one wood-cuts. Philadelphia: Lea Brothers & Co., 1885.

The Management of Labor and of the Lying-in Period. A Guide for the Young Practitioner. By HENRY G. LANDIS, A.M., M.D., Professor of Obstetrics and Diseases of Women in Starling Medical College. Philadelphia: Lea Brothers & Co., 1885.

A Text-Book of Pharmacology, Therapeutics, and Materia Medica. By T. LAUDER BRUNTON, M.D., D.Sc., F.R.S., Fellow of the Royal College of Physicians. Adapted to the United States Pharmacopœia by FRANCIS H. WILLIAMS, M.D., Boston, Mass. Philadelphia: Lea Brothers & Co., 1885.

Fownes' Manual of Chemistry, Theoretical and Practical. A new American from the twelfth English edition, embodying Watts' "Physical and Inorganic Chemistry," with one hundred and sixty-eight illustrations. Philadelphia: Lea Brothers & Co.

A Manual of Human Physiology, including Histology and Microscopical Anatomy, with special reference to the Requirements of Practical Medicine. By Dr. L. LANDOIS, Professor of Physiology and Director of the Physiological Institute, University of Greifwald. Translated from the fourth German edition, with additions by WILLIAM STIRLING, M.D., Sc.D., Regius Professor of the Institutes of Medicine or Physiology in the University of Aberdeen. Vol. II. Philadelphia: P. Blakiston, Son & Co., 1885.

Lectures on the Diagnosis of Diseases of the Brain, delivered at the University College Hospital. By W. R. GOWERS, M.D., F.R.C.P., Assistant Professor of Clinical Medicine in University College. Philadelphia: P. Blakiston, Son & Co., 1885.

A Practical Treatise on Diseases of the Kidneys and Urinary Derangements. By CHARLES HENRY RALFE, M.A., M.D. (Cantab.), F.R.C.P. London. Philadelphia: P. Blakiston, Son & Co., 1885.

An Introduction to the Study of the Diseases of the Nervous System, being lectures delivered in the University of Edinburgh during the tercentenary year. By THOMAS GRAINGER STEWART, M.D., F.R.C.P.E., Professor of the Practice of Physic and of Clinical Medicine, University of Edinburgh. Philadelphia: J. B. Lippincott Company, 1885.

A Complete Pronouncing Medical Dictionary, embracing the Terminology of Medicine and the Kindred Sciences, with their Signification, Etymology, and Pronunciation. With an Appendix comprising an explanation of the Latin terms and phrases occurring in Medicine, Anatomy, Pharmacy, etc. By JOSEPH THOMAS, M.D., LL.D. Philadelphia: J. B. Lippincott Publishing Company, 1886.

A Treatise on Nervous Diseases; their Symptoms and Treatment. A Text-Book for Practitioners. By SAMUEL G. WEBBER, M.D., Clinical Instructor in Nervous Diseases, Harvard Medical School. New York: D. Appleton & Co., 1885.

A Practical Treatise on the Diseases of Children. By ALFRED VOGEL, M.D., Professor of Clinical Medicine in the University of Dorpat, Russia. Translated and edited by H. RAPHAEL, M.D., formerly House Surgeon to Bellevue Hospital. Third American from the eighth German edition, revised and enlarged. Illustrated by six lithographic plates. New York: D. Appleton & Co., 1885.

Hand-Book of General Therapeutics. Vol. I. Introduction by Professor H. VON ZIEMSSEN. On the Dietary of the Sick, and Dietetic Methods of Treatment by Prof. BAUER. On the Koumiss Cure by Dr. STANGE. Vol. II. Antipyretic Modes of Treatment by Prof. C. VON LIEBERMEISTER. Antiphlogistic Methods of Treatment by Prof. TH. JÜRGENSEN. Epidermic, Endermic, and Hypodermic Administration of Medicines by Prof. A. EULENBURG. Vol. III. Respiratory Therapeutics by Prof. M. J. OERTEL, M.D., of Münich. New York: Wm. Wood & Co., 1885.

Poisons; their Effects and Detection. A Manual for the Use of Analytical Chemists and Experts, with an Introduction on the Growth of Modern Toxicology. By ALEXANDER WYNTER BLYTH, M.R.C.S., Public Analyst for the County of Devon. With tables and illustrations. 2 vols. New York: William Wood & Co., 1885.

Laryngoscopy and Rhinoscopy in the Diagnosis and Treatment of the Throat and Nose. By PROSSER JAMES, Lecturer on Materia Medica and Therapeutics at the London Hospital. Fourth edition. Enlarged, illustrated with hand-colored plates. New York: William Wood & Co., 1885.

On Renal or Urinary Affections. By W. HOWSHIP DICKINSON, M.D., Cantab., F.R.C.P., Physician to and Lecturer on Medicine at St. George's Hospital. New York: William Wood & Co., 1885.

Neuralgia and the Diseases which Resemble it. By FRANCIS E. ANSTIE, M.D. London, F.R.C.P. New York and London: G. P. Putnam's Sons, 1885.

Acne; its Etiology, Pathology, and Treatment. A practical treatise based on the study of one thousand five hundred cases of sebaceous disease. By L. DUNCAN BUCKLEY, A.M., M.D., Physician to the New York Skin and Cancer Hospital. New York and London: G. P. Putnam's Sons, 1885.

Six Lectures upon School Hygiene, delivered under the auspices of the Massachusetts Emergency and Hygiene Association to Teachers in the Public Schools. Boston: Ginn & Co., 1885.

Moisture and Dryness; or, the Analysis of Atmospheric Humidities in the United States. An essay read before the American Climatological Association (1884), including the presentation of a rate of moisture and dryness, by which the climate is evenly subdivided, according to the combined evidences of moisture, together with seasonal cloudiness and absolute humidity Signal Service charts. By CHARLES DENISON, A.M., M.D., Professor of Diseases of the Chest in the University of Denver. Chicago, 1885.

Manual of the Antiseptic Treatment of Wounds for Students and Practitioners. By W. WATSON CHEYNE, M.B., F.R.C.S., Assistant Surgeon to King's College Hospital. With illustrations. New York: J. D. Vail & Co., 1885.

The Technology of Bacteria Investigations. Explicit directions for the study of Bacteria, their culture, staining, mounting, etc., according to the methods employed by the most eminent investigators. By CHARLES S. DOLLEY, M.D. Boston: S. E. Cassino & Co., 1885.

Plumbing Problems, or Questions, Answers, and Descriptions relating to House-Drainage and Plumbing. From the Sanitary Engineer. New York: The Sanitary Engineer, 1885.

Inebriism; a Pathological and Psychological Study. By J. L. WRIGHT, M.D., Member of the American Association for the Cure of Inebriates. Columbus, O.: W. G. Hubbard, 1885.

Practical Therapeutics. A compendium of selected formulæ and practical hints on treatment, systematically arranged, interleaved, and copiously indexed. By EDWARD J. BIRMINGHAM, A.M., M.D., Fellow and Vice-President of the American Academy of Medicine.

A Treatise on Epidemic Cholera and Allied Diseases. By A. B. PALMER, M.D., LL.D., Professor of Pathology, Practice of Medicine and Clinical Medicine in the College of Medicine and Surgery in the University of Michigan.

Report on the Mortality and Vital Statistics of the United States, as returned at the Tenth Census (June 1, 1880). By JOHN S. BILLINGS, Surgeon U. S. Army. Part I. Washington: Government Printing Office, 1885.

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Remarks on Typhoid Fever in the Young. By A. JACOBI, M.D., Clinical Professor of Diseases of Children in the College of Physicians and Surgeons in New York. Reprint. Philadelphia: John E. Potter & Co., 1885.

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THE

AMERICAN JOURNAL

OF THE MEDICAL SCIENCES

FOR OCTOBER, 1885.

ARTICLE I.

A CONTRIBUTION TO THE STUDY OF DIPHTHERIA OF THE ŒSOPHAGUS; WITH THE REPORT OF A CASE.

By H. D. FRY, M.D., Washington, D. C.

DIPHTHERIA of the œsophagus is a rare affection. According to Rilliet and Barthez,[1] this part of the alimentary canal is always unaffected. Such, they say, has been the case in a number of observations published by authors, notwithstanding that Bretonneau has observed two cases in which false membrane penetrated into the œsophagus. Guersant,[2] writing in 1835, states that he has several times found the stomach partly covered with a false membrane, but diphtheria of the œsophagus, he thinks, must be unusual, because he has never met with a case, nor does he know of any author who has. Bouchut,[3] Espagne,[4] Greenhow,[5] and others consider the affection, but do not appear to have met with any cases.

Espagne quotes two cases, one communicated by Dr. Albert Puech, which occurred in a child suffering from pneumonia, and the other, reported by Vidal, was developed in a typhoid fever patient. Wilks and Moxon,[6] West,[7] Rechou,[8] Laboulbène,[9] and Morell Mackenzie,[10] have had a few cases fall under their observation. West says: "In two instances, though the throat was free of false membrane, the œsophagus was lined by it for two-thirds of its length; the subjacent mucous surface showing but very slight increase of vascularity, and the exudation being but very loosely connected with it." Rechou, describing a series of *post-mortem* examinations made upon patients who had died of diphtheria, states that "in the last two, the stomach, the œsophagus, and the tongue were covered with a membrane of the same nature as that which occurs in the bronchi, very adherent, almost solid." Laboulbène has seen three cases, Wilks and Moxon two.

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[1] Maladies des Enfants, t. i. p. 322.

[2] Memoirs on Diphtheria. Sydenham Society Translation, London, 1859, p. 220.

[3] Ibid., p. 277.

[4] De la Diphthérite, Montpellier, 1860, p. 102.

[5] On Diphtheria, by E. H. Greenhow, M.D., New York, 1861, p. 112.

[6] Pathological Anatomy, London, 1875, p. 365.

[7] Diseases of Infancy and Childhood, London, 1874, 6th edit., p. 426.

[8] Journal Générales de Médecine, Paris, 1805, vol. xxii. pp. 5 and 6.

[9] Nouveau Eléments d'Anatomie Pathologique, Paris, 1879, p. 85.

[10] Manual of Diseases of the Throat and Nose, Wm. Wood & Co., New York, 1884, pp. 48 and 49.

Mackenzie has observed two cases, "one in a child aged three, in which the upper third of the œsophagus was covered with a thick adherent membrane, a similar deposit being present in the pharynx. The other case was that of a boy, aged six, whose pharynx, posterior nares, larynx, and trachea were covered with false membrane, while the whole of the œsophagus to within an inch of the cardia was similarly coated." Wagner,[1] author of *General Pathology*, says the disease seldom appears in the œsophagus, and he quotes West as having stated that he found this part unaffected even when the mucous lining of the stomach was covered with pseudo-membrane. Wagner himself had seen only two instances in which it extended over the *uppermost part* of the œsophagus. Jones and Sieveking[2] also mention that this part of the tube is sometimes involved.

Jacobi[3] takes exception to the statement of Zenker and Ziemssen that diphtheritic inflammation ceases abruptly at the inferior extremity of the pharynx. He believes that in general diphtheria it is common for the exudation to invade the upper part (from one-half to one inch) of the œsophagus. The authors whom he thus criticizes express the view[4] that the œsophagus presents a high degree of immunity against diphtheritic invasion. As a rule, they say, even in the most severe cases, the process ends on the lower margin of the pharynx, and leaves the œsophagus entirely free. This immunity is strikingly illustrated by those cases in which the diphtheria first attacks the pharynx and larynx, and then invades the mucous membrane of the stomach, and leaves the œsophagus untouched. They admit, however, that in rare cases the disease extends from the pharynx to the upper part of the œsophagus, or even as far as the cardia.

These opinions conclusively demonstrate the infrequent occurrence of diphtheritic œsophagitis. One other proof is brought forward. An examination of the catalogues of a number of medical museums reveals but two which possess any specimens of this nature. Specimen No. 2292[1] of the Museum of the Royal College of Surgeons of England was presented by Dr. Goodhart in 1875. It is

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[1] Ziemssen, Cyclop., vol. vi. p. 942.

[2] Pathological Anatomy, London, 1875, p. 551.

[3] Treatise on Diphtheria, New York, 1880, p. 83.

[4] Ziemssen, Cyclop., German edition, 1878, pp. 139–141.

> "a larynx, pharynx, and œsophagus, showing the effect of acute inflammation of the mucous membrane of the œsophagus, probably diphtheritic. The surface is discolored by the extravasation of blood. The mucous membrane is everywhere thickened, thrown into abnormally thick longitudinal folds, and flocculent from the presence of superimposed lymph."

The second is specimen No. 76,[2] presented by M. Guersant to the Museum of Dupuytren. It consists of a false membrane which occupied the greater part of the œsophagus of a little child, aged five years. It is 12 centimetres (about five inches) long, of considerable thickness, and presents some longitudinal striæ parallel to the axis of the canal. This same specimen, it seems, was exhibited by M. Millard[3] to the members of the Anatomical Society of Paris. He stated that it was expelled by efforts at vomiting, and incorrectly gave it a length of 17 centimetres (about seven inches). Ch. Talamon,[4] who reported a case of diphtheria of the œsophagus, which will be quoted in its proper place, does not attribute this immunity to any anatomical peculiarity of the part, but believes with M. Empis and M. Isambert that atmospheric contact is necessary for the production of diphtheritic deposit. M. Empis[5] says :—

> "One fact which is rather remarkable in relation to the seat of diphtheria is this, namely, that all the parts which are completely removed from the contact of the air are preserved from the invasion of the disease. Thus, we very frequently see the membranous affection occupying the lower part of the throat, and the posterior wall of the pharynx, and spreading gradually to the larynx and deeper parts of the air-tubes; but I have never seen *true diphtheritis* propagating itself by continuity into the œsophagus and the parts of the digestive canal which are withdrawn from the influence of the air."

On the same grounds Empis bases a differential diagnosis between diphtheria and *muguet*, which latter has a great tendency to extend into the digestive tube. At the time he wrote, the term *diphthérite* was indiscriminately applied to all aphthous and pseudo-membranous formations, and for this reason he made use of, and italicised, the word *true*. Several weighty objections stand in the way of our accepting this theory.

We now know that diphtheritic deposit may be propagated to, or even occur primarily upon mucous surfaces which are removed from all atmospheric contact. Also we know that the mucous membrane of the œsophagus is little disposed to take on inflammatory action of any kind. Consequently, there is more reason to accept as the correct view, that which attributes the infrequent occurrence of both diphtheria and inflammation of the œsophagus to the thickness of the epithelial layer of its mucous membrane, and to comparative paucity of its vascular supply.

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[1] Descriptive Catalogue, J. and A. Churchill, 1884, p. 72.

[2] Catalogue, M. M. Houel, Paris, 1879, p. 219.

[3] Bull. Soc. Anat. de Paris, 1858, xxxiii. p. 90.

[4] Ibid., 1878, liii. p. 461.

[5] Memoirs on Diphtheria, Syd. Soc. Transl., 1859, p. 311.

Oppolzer[1] recognizes three varieties of œsophagitis: catarrhal, croupal, and pustular, either of which, he says, occurs as an idiopathic affection less frequently than as consecutive to some other disease. A fourth class may be made to comprise cases due to poisoning by caustic[2] substances in which more or less extensive gangrene of the mucous membrane is present. Croupal inflammation of the œsophageal mucous membrane, he goes on to state, is a much rarer affection than catarrhal, and exists in combination with croup of the pharynx or larynx, or, in certain cases, in connection with croupal pneumonia. "It is also encountered in typhus fever, in the third or fourth week of the disease; in the acute exanthemata, especially in smallpox; in cholera; in pyæmia; often, also, in dysentery; and, finally, in tuberculosis and carcinoma."

Various writers likewise mention the occurrence of pseudo-membranous œsophagitis after injuries, and in connection with different affections.

Croupal inflammation of the œsophagus is subdivided by some authors (Jacobi, Zenker and v. Ziemssen, and others) into œsophagitis fibrinosa and diphtheritica.

These two forms of inflammation are frequently found associated in the same case, fibrinous exudation being upon one part of the mucous surface and diphtheritic inflammation upon another. The fibrino-diphtheritic œsophagitis is more particularly the expression of secondary disease.

Through kindness of the gentlemen in charge of the Medical Library of the Surgeon-General's office, I have been enabled to review much of the literature bearing upon this subject, and to collect reports of cases of diphtheria of the œsophagus found therein. Cases other than these mentioned are doubtless recorded, but failure to find them is explained by the fact that they are scattered through articles on diphtheria without being titled in such manner as to associate the disease with its occurrence in the œsophagus.

Membranous casts of the œsophagus have been expelled as a result of other than diphtheritic disease. J. Solis Cohen[3] quotes from Birch-Hirschfeld[1] a case which would indicate that such a result might follow catarrhal œsophagitis when existing in a severe form. The epithelial coat of two-thirds of the entire length of the œsophagus was detached from this patient and expelled by emesis. Acute subepithelial suppuration was supposed to have detached the membranous tube. A unique case is recorded by Matthias Jacobaeus[2] of a man who had difficulty in swallowing for two years and a half. He could get no relief until he passed by stool a false membrane that came from the œsophagus.

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[1] Von Oppolzer's Lectures on Diseases of the Œsophagus, condensed from the German by J. Solis Cohen, M.D., Phila. Med. Times, iii. p. 297, etc.

[2] Dr. Wrany reported the case of a man who vomited a quantity of blood, and with it there came into his mouth a mass which was found to be the mucous lining of the stomach and lower half of the œsophagus. Prof. Trietz, to whom the specimen was submitted, considered it the result of the action of sulphuric acid, and expressed the opinion that the man would die from stricture of the œsophagus. The stricture developed and the man died three months later. Dr. Wrany, although he accepted this explanation, very strangely reported the case under the title of "Diphtheria of the Œsophagus and Stomach."—Vrtljschr. f. d. prakt. Heilk. Prag. 1866, xc. p. 113.

[3] Pepper's American System of Medicine, vol. ii. p. 412.

Another case, interesting on account of its probably diphtheritic nature, is given by Bleuland.[3] He relates that he has in his possession a membrane more tenacious than the œsophagus, but similar in length and shape to it, which was expelled from the mouth of a female to whom he was called for the first time while in her death agony. Her friends thought a worm had been cast out. For two days he immersed the specimen in water, for the purpose of ridding it of filth, but he could not clean it sufficiently to recognize the nature of the membrane. He placed it in alcohol, "in which," he says, "it is still preserved; but whether it is the real lowest skin of the œsophagus, or a cohering tube of mucus, more tenacious than usual, such as I have seen ejected from the windpipe with the ramifications of the bronchi preserved, I would not dare to decide positively."

From the graphic description, one is almost permitted to believe that the specimen was a true diphtheritic cast of the œsophagus; a conclusion suggested by the writer's comparison of its appearance to membranous casts of the trachea and bronchi. The only clinical history obtained by him was that diarrhœa, with occasional bloody discharges, had existed for several days. At the time he was called to the patient her pulse was weak and irregular, hands and feet cold, face Hippocratic, breathing quick, and the humors were expelled with putrid smell.

Another case was recounted, in the year 1712, by M. Winslou,[4] which was more obscure in its nature:—

> A man, aged 35 years, of florid complexion, had an apoplectic attack. He fell with convulsive movements, loss of consciousness, and from that became comatose. Finally, when he became conscious, he complained of a violent pain in his throat, and had much pain in swallowing. The next day he vomited a membranous tube of a finger's length, and during the remainder of the day brought up, always with blood, enough different portions of the tube to make the entire length of the œsophagus. It was really the internal membrane of the œsophagus which had become detached and narrowed. Swallowing liquids caused the man a burning pain. M. Winslou examined the patient after he had recovered from all his symptoms except a hoarseness. Nothing unusual was perceived except that the palate and neighboring parts were slightly inflamed.

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[1] Lehrbuch, der pathologische Anatomie, Ziemssen, 1877, p. 818.

[2] *Acta Medica.* Thomas Bartholini, 1671 and 1672, p. 212.

[3] Observationes Anatomico-Medicæ de Sanâ et Morbosâ œsophagi structurâ. Lugd. Batav. in 4⁰. 1784, pp. 19–20.

[4] Collection de Pièces Académiques, tome iii., partie française. Paris, 1769, p. 550.

The reports of a number of the cases found add but little information to the clinico-pathological history of this disease. In some, the diagnosis is more than doubtful, and in many the symptoms are but briefly described.

The observations of Andral and Cruveilhier have been frequently referred to by writers on the subject. Andral[1] merely states: "M. Gari, resident physician at the Hôpital des Enfans Trouvés, lately showed me the œsophagus of a new-born infant, the internal surface of which was lined for about a third of its extent with a layer of whitish, solid matter, which could not be detached without difficulty from the subjacent membrane, and seemed to me to be situated beneath the epithelium. There was no trace of false membrane in the rest of the alimentary canal."

Cruveilhier[2] is even less satisfactory. He says: "I have found, among the observations of M. Dupuytren, a very remarkable example of an inflammation of the œsophagus marked by the formation of a thick false membrane, which covered this musculo-membranous canal in all its length."

Grimand's[3] case is open to the same objection. He recently discovered in the œsophagus a membranous formation, whitish, adherent, half a line thick, and prolonged as far as the stomach, a peculiarity which appeared very strange to Drs. Grimoux and Moncla, present at the autopsy of a child who had died of intense croup which began by angino-tonsillaris.

Steffen[4] has reported a series of *post-mortem* examinations in which he found the œsophageal mucous membrane affected, to a greater or less extent, by pseudo-membranous deposit. In two cases the diphtheritic disease was idiopathic, and in thirteen it was secondary to pneumonia, miliary tuberculosis, scarlatina, peritonitis with abscess of the spleen, and intestinal catarrh.

The following are reports of cases of diphtheria of the œsophagus which have been collected from various sources. They are considered under two classes: *idiopathic* and *secondary.*

CASES OF IDIOPATHIC ATTACKS OF DIPHTHERIA OF THE ŒSOPHAGUS.

CASE 1.—On Monday, March 23d, 1885, I was called to see Miss Fannie H. S., American, eighteen years of age. She had remained in bed since the Saturday preceding with the hope that rest would relieve her of a profuse menstrual flow which had lasted one week. She had never before had any trouble with her catamenia.

I found her sitting up in bed spitting blood freely into her handkerchief, and it was on account of this hemorrhage, which had lasted twenty-four hours, that medical aid was sought.

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[1] Treatise on Pathological Anatomy, English translation, New York, 1832, vol. ii. p. 172.

[2] Essai sur l'Anatomie pathologique en Général, Paris, 1816, t. i. p. 146.

[3] Nature et Anatomie Pathologique du Croup, ou Angine trachéale des Enfans. Journal du Dictionnaire des Sciences Médicales, Paris, 1821–1822, vols. xi. and xii. p. 234.

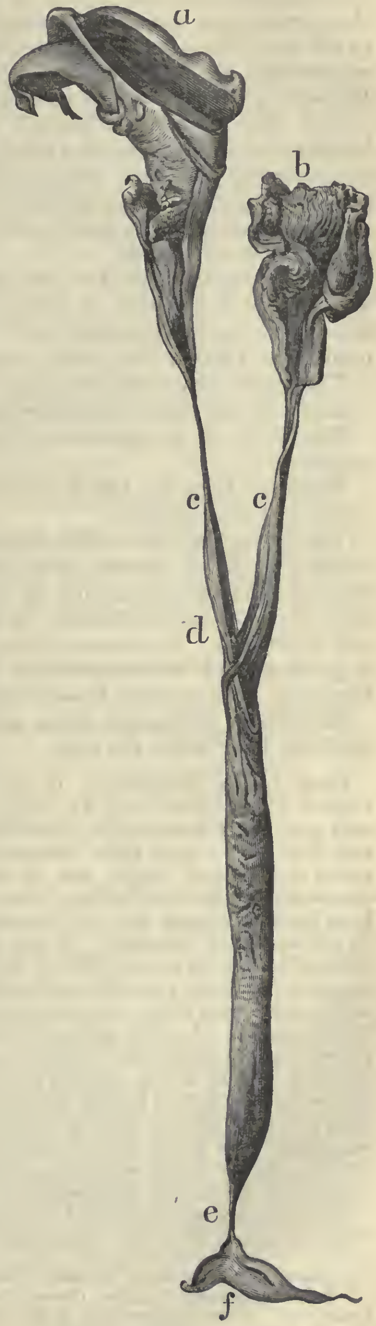
[4] Jahrb. f. Kinderheilk., Leipzig, 1868–9, Bd. ii. pp. 142–168.

On examination the right tonsil was found to be the source of the bleeding, and upon this and the opposite tonsil were two patches of diphtheritic membrane. No complaint had been made of sore throat. Her pulse was 120 and feeble; temperature 103° F. I ordered a potassium chlorate and tincture of chloride of iron mixture; milk diet, and directed the throat to be frequently atomized with carbolic acid and lime-water, 1 to 64.

24*th.* The bleeding had continued without change. I applied to the right tonsil Monsel's solution diluted one third with glycerine and containing carbolic acid in the proportion of 1 to 32. Same treatment continued and a tablespoonful of whiskey ordered every four hours.

25*th.* The bleeding had been less. A large piece of false membrane was removed from the right tonsil and the subsulphate of iron solution was applied to the surface. The exudation extended over the right pillar of the fauces and fringed the uvula. The potassium chlorate and tincture of iron mixture was discontinued on account of the nausea it occasioned, and I ordered instead digitalis and bichloride of mercury.

26*th* and 27*th.* Thick and blackened pieces of pseudo-membrane, when removed from the right tonsil and corresponding side of the pharynx, would reappear, fully formed within less than twenty-four hours. The patient complained of choking sensations, and anxiously looked for the relief which forcible removal of these patches brought. The pulse



a. A mass of diphtheritic membrane and clotted blood from the top of the pharynx, incised to show its internal structure.

b. Patch of membrane from the right tonsil, which is stained dark by the action of iron.

c, c. Points corresponding to the beginning of the œsophagus.

d. Point of union. The prolongation of membrane from the pharyngeal mass *a*, completely enveloping that from the tonsil, *b*.

e. From the constricted portion of the œsophagus near the cardiac end of the stomach.

f. A piece which was evidently detached from the gastric mucous membrane.

ranged from 120 to 140, and the temperature from 104° to 105°. She was becoming very anæmic. Hemorrhage recurred from the tonsil at irregular intervals, and attacks of epistaxis became a troublesome feature. Her breath was exceedingly offensive, and imparted a disagreeable odor to the air of the room. The menstrual flow changed at times to a sero-sanguineous discharge and contained pieces of diphtheritic membrane. Whiskey and milk were given freely.

28th. Her restlessness reached a climax at 6 A. M., when, by a combined retching and hawking effort, she dislodged and spat up a long cast of membrane. She was immediately relieved and went to sleep. Several attacks of epistaxis occurred during the day, and the anæmia was progressively increasing. The bichloride of mercury was stopped; digitalis, milk, and whiskey continued.

29th. I was summoned to see the patient at one o'clock in the morning on account of a return of the choking and of hemorrhage. When I reached the room her mother said, "Doctor, you are too late; she has just brought up another long piece of membrane and is relieved."

The membranous cast was found in the chamber, and is faithfully represented by the cut on the preceding page.

The length of the specimen (from *a* to *e*) is fifteen inches (37½ centimetres).

From *c c* to *e*, the length of the œsophagus, a little less than nine inches (22 centimetres).

During the day of the 29th the patient gradually lost strength. I saw her at 3 P. M., in answer to an urgent message. Profuse epistaxis had weakened her still more, and the pale face of the sufferer was rendered more blanched in appearance by contrast with the blood-stained cloths and pillow-slip. Her temperature remained above 104 degrees all day. A patch of diphtheritic exudation formed upon the inner surface of the lower lip. Six or eight bloody stools were passed.

She died of exhaustion about midnight, having retained consciousness until one hour before the end.

Case 2.—By Horteloup.[1] P. L., aged 19 years, male, slightly developed, entered l'Hôtel-Dieu July 24, 1825. He had been seized four days before with pain in his throat which prevented him from supping. He went to bed, and next day, after a quiet night, resumed work. A little difficulty in deglutition, added to a frequent cough, was all that he suffered from. Fever, swelling of the tonsils, and severe headache came on during the night, and forced him to keep his bed the next day. He remained thus without attention for two days. Symptoms soon increased. A convulsive cough and impossibility to swallow induced his friends to send him to the Hôtel-Dieu. Skin warm and dry; pulse frequent and feeble; cough convulsive and dry. Efforts to speak increased the suffocation. Soft palate very red; tonsils swelled and of a grayish color; no pain at epigastrium. Leeches applied to the top of the sternum permitted the patient to swallow some mouthfuls of liquid, something he had not been able to do since morning. Next day he coughed up a cast of the trachea and bronchi. Improved somewhat: respiration became freer, and deglutition easier. Unfavorable symptoms returned, and he died of suffocation on the next day. *Autopsy.*—False membrane was found to have extended from the nasal fossa to the pharynx, over the tonsils, *and invaded the upper half of the œsophagus.* It was also prolonged into the trachea and bronchi. Mucous membrane red.

Case 3.—By Abercrombie.[2] "Gentleman, aged 26, came to town in June, 1826, to consult me about complaints in his head. On his journey he thought he caught cold in crossing the Frith of Forth, and, when I saw him, he complained of his throat, and there was a granular swelling on the right side of his neck. His voice was hoarse, with a peculiar husky sound.

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[1] Obser. de Croup chez l'Adulte. Thèse, Paris, 1828, in 4to., No. 53. Case II.

[2] Pathological and Practical Researches on Diseases of the Stomach, the Intestinal Canal, etc. John Abercrombie, M.D., 3d Am. from 2d London edit. Phila., Carey, Lea, & Blanchard, 1838, pp. 87–88.

"The fauces were of a bright red color, without much swelling, but were covered in several places with aphthous crusts. He was at this time not confined, and there was no fever; but, after a few days, he became feverish, and other symptoms continued as before. He was now confined to bed and actively treated, and after eight or nine days he was much better, so as to be able to be out of bed; but there was still some rawness of the throat, with small aphthous crusts, and a husky sound of the voice. After a few days there was a recurrence of the fevers, which now assumed a typhoid type, with considerable appearance of exhaustion. He had some dyspnœa, with considerable difficulty of swallowing.

"The attempts to swallow excited sometimes cough, and sometimes vomiting; and by both he brought up considerable quantities of a soft membranous substance. He became more and more exhausted, without any remarkable change in the symptoms, and died at the end of about three weeks from the first appearance of the disease. For twelve hours or more before death he swallowed pretty freely.

"*Inspection.*—The whole of the pharynx was covered by a loose soft adventitious membrane, which also extended over the epiglottis, and portions of it were found lying in small irregular masses within the larynx, at the upper part. *A similar membrane was traced through the whole extent of the inner surface of the œsophagus, quite to the cardia.* Near the cardia it lay slightly attached, forming a soft continuous mass about a third of an inch in diameter, and with the œsophagus closely contracted around it. The other parts were healthy."

The author carefully avoids committing himself by giving an expression of opinion as to the nature of the sickness from which his patient died, a caution we can readily appreciate when we consider the fact that the case came under his care in the year 1826.

Bretonneau was then just elucidating those views of diphtheria which subsequently proved the basis of a more correct pathology. Abercrombie, when writing the first edition of his work,[1] said the disease was not common in Scotland, but that it had been very fatal in Edinburgh in 1826. "It is," he says, "evidently an affection quite distinct from the idiopathic inflammation of the membrane of the larynx, to which we commonly apply the name of Croup."

The clinical picture he draws of the case and the result of the post-mortem examination clearly show that he had an attack of idiopathic diphtheria, to treat which was of unusual interest in consequence of the invasion of the mucous membrane of the œsophagus.

Case 4.—By M. Millard.[2] A delicate child three years of age was treated for a small cold abscess below the jaw of the right side. Five or six days afterwards she became affected with general diphtheria. The false membrane developed upon the skin, at the opening of the abscess; in the mouth; upon the tongue, pharynx, œsophagus, trachea, bronchia, and vulva. She died from croup on the fifth day. At the autopsy the œsophageal mucous membrane was found to be implicated *in its lower half only.* At about ten centimetres (four inches) below the cricoid cartilage patches of pseudo-membrane were apparent. They presented exactly the same appearance as those in the pharynx, were disposed in vertical lines, and increased progressively in extent from above downwards. Quite at the lower extremity these coalesced to form a complete tube; at the level of the cardia they occupied only the anterior half of the tube, and stopped abruptly two millimetres below the line marking the limits of the epithelium of the stomach and œsophagus. The stomach was small, and neither it nor the intestines revealed any traces of diphtheria.

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[1] Ibid., Edinburgh, Waugh & Innes, 1828.

[2] Bull. Soc. Anat. de Par., 1858, xxxiii. pp. 216–219.

Case 5.—By Bretonneau.[1] A very weak and small child of fifteen died of croup. White, thick, coriaceous pellicles lined the walls of the pharynx and of the trachea, and extended over the whole of the pituitary membrane. The false membrane had seldom been found so tenacious and elastic. *It passed deep into the œsophagus*, but in place of forming there a complete tube, it was spread out by distinct bands which were terminated in points at different distances; the longest reached the cardiac end of the stomach. A rather vivid redness descended below the false membrane and circumscribed it; so that between each red dotted streak there remained a perfectly healthy interval.

Case 6.—By Ch. Talamon.[2] L. Marie, aged two and a half years, entered Saint Eugénie Oct. 10, 1878; eighth day of her sickness. The disease began with malaise, slight fever, and some pain in swallowing. After four or five days a doctor was consulted, who recognized membranous sore throat and ordered an emetic. Two days later the mother observed a slight yellow discoloration of the conjunctivæ, and the urine became very dark-colored. Since yesterday morning the cough has become harsh and the voice extinguished.

Later she had difficulty of breathing, with paroxysms of suffocation; an icterode color of the face and conjunctivæ, but not of the body. Urine albuminous.

Tracheotomy was performed, but the child died fourteen hours afterwards.

Autopsy two hours after death. Tonsils and pharynx covered with pseudomembrane which extended into the larynx and œsophagus. *The membrane was rather thin, and adhered closely to the mucous membrane of the upper fourth of the œsophagus; it became thicker, but was more readily detached throughout the rest of the canal.* Whilst in the upper part it could be raised up only in shreds just as in the pharynx, it appeared lower down like false membrane from the bronchial tube and was attached by long ribbon-like bands; in the lower fifth it contracted into a narrow string which was prolonged to, but not through the cordia.

Gastric mucous membrane was of normal appearance.

Case 7.—By Jacobi.[3] Boy, four years of age, was under treatment for stricture of the œsophagus caused by having swallowed lye one year before. He was improving, and could swallow semi-solid food when an attack of diphtheria developed. The air-passages were involved, he became unable to swallow, and died.

At the autopsy, diphtheritic exudation was found in the air-tubes. The œsophagus was normal for the first five inches (about 12 centimetres) of its extent. Below this point there existed a tight stricture from one to one and a half inches (two and a half to four centimetres) long. *This stricture was the seat of diphtheritic deposit and infiltration which had caused it to contract very tightly.* The use of bougies had evidently caused the disease to manifest itself at the seat of stricture.

The origin of my case, like so many sporadic ones, is a riddle for the Sphynx. The young lady was a member of a large household, no others contracted the disease, and, as far as I am aware, no cases of diphtheria had existed in the neighborhood within a reasonable time. An inspection of the sanitary condition of the premises yielded the usual negative result.

The bloody stools which were passed during the last of her sickness doubtless owed their origin to the invasion by diphtheritic exudation of the mucous lining of some part of the intestinal canal. They could scarcely be attributed to the administration of the bichloride of mercury.

[1] Memoirs on Diphtheria, Syd. Soc. Transl., 1859, p. 18.

[2] Bull. Soc. Anat. de Paris, liii. 1878, p. 460.

[3] Treatise on Diphtheria, New York, 1880, p. 83.

The stools were unaccompanied by griping, and did not appear until after the drug had been suspended. It was given in doses of 5 milligrams every four hours, increased after the first twenty-four hours to 7 milligrams at a dose. No disturbance of the stomach was caused by its use. The entire absence of those low, typhoid symptoms which usually develop in grave cases of diphtheria, and which are dependent upon a septic poison, would tend to argue in favor of the antagonistic influence of bichloride of mercury against such secondary blood-poisoning. The expression of the patient was bright, she was intelligent throughout her sickness, and answered questions promptly; in fact, her pale face alone gave evidence, by sight, of the terrible malady under which she suffered. The destruction of the blood elements manifested by the extreme and progressively increasing anæmia continued until life seemed no longer compatible with its altered state.

On one occasion, when 72 centigrams of quinia were given for its antipyretic effect, the patient had a severe attack of epistaxis follow. Its further administration was withheld because of the fear that by increasing cerebral congestion it would render more liable the recurrence of such attacks.

The digitalis was given in accordance with my habit, of some years' standing, of administering it in all, or nearly all, cases of diphtheria, not only during the attack but until convalescence is well established. If digitalis were used more generally in this disease, I believe there would be fewer cases to report of sudden death from heart failure. Its use is imperatively called for when there exists either an intermittent or a rapid and feeble pulse. Even the abnormally slow pulse which so often accompanies or follows the disease is, according to my experience, an indication calling for the exhibition of the drug.

Cases of Secondary Attacks of Diphtheria of the Œsophagus.

Under the head of secondary attacks are considered not only cases that develop during the existence of another disease, but also those which occur after the primary disease has run its course. These latter occur during, or soon after, the convalescence of the primary disease, and consequently partake more of the nature of idiopathic attacks.

Case 8.—By Hennig.[1] The four children of M. Hennig were infected with scarlet fever by a physician who had called to pay a friendly visit. The disease pursued a regular course in the children, but not so with the servant, who was attacked at nearly the same time as they. No trace of an eruption presented itself in her, but she offered an array of very grave symptoms, which indicated that the affection, so to speak, had concentrated itself upon the œsophagus. On the eighth day of sickness the patient felt a constant tickling in the œsophagus. This tickling caused a violent and constant cough, which persisted until the twelfth day. At this time, the menses having appeared, she rapidly improved, and expectorated by cough a large quantity of membranous *débris*, like that which we witness upon the surface when in this disease the desquamation of the skin takes place.

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[1] Bibliothèque Médicale, Paris, 1817, t. lviii., p. 384.

Case 9.—By M. Louis.[1] A woman, aged 32 years, was admitted into La Charité in May, 1823, with all the symptoms of advanced phthisis. Thirst great, anorexia complete, deglutition easy, without pain in the throat, epigastrium very sensitive to slight pressure, speech short, cough moderately frequent and dry. A month or so after admission she complained of a pain in her throat, with some difficulty in swallowing. The pain persisted for four days, when she became much worse; the pharynx was very red, and pain extended along the trachea as far as the sternum. This was accompanied by a sensation of tension and swelling in this part; no alteration of voice; fever high; deglutition difficult. The patient expectorated some membranous pieces during the night. The next day her depression was such that she would not submit to an inspection of her throat. Swelling of the neck increased. M. Chomel examined the patient and discovered a false membrane covering the pharynx, tonsils, and palate. The patient died that night.

Autopsy.—Palate, tonsils, and pharynx were covered with a false membrane half a line in thickness, and very adherent to the mucous membrane. *The false membrane extended into the œsophagus four inches* (10 centimetres) *below the cricoid cartilage*, diminishing successively in thickness and consistency. It also passed into the larynx, trachea, and bronchi. The mucous membrane of the stomach at the anterior and superior part was red and covered with a soft false membrane.

Case 10.—By Bretonneau.[2] Three days after the death of one child, a sister, aged eight months, became sick. There were fever, cough, swelling of the parotid regions, and difficulty of respiration. The back of the mouth was covered with grayish incrustation. A sponge moistened with concentrated hydrochloric acid was applied to the isthmus of the throat, and the same application repeated, night and morning for three days. Dyspnœa increased, pulse became small and frequent, and death occurred on the sixth day. It was suspected that the application of hydrochloric acid had been too frequent and too strong. *Autopsy.* The villous coat of the tongue appeared rather deeply altered by the action of the local remedy. The uniform white tint of all the anterior part of the velum palati and the tonsils was manifestly due to cauterization. The membraniform exudation, which was extremely thick, but not very adherent, extended from the pharynx and nasal fossæ *downwards to the cardiac orifice of the stomach.* Under this exudation the mucous membrane of the œsophagus appeared in a healthy state. It is not very probable that its formation was determined by the application of the acid, for every cauterization occasioned efforts of vomiting. The false membrane did not invade the air-tubes. The mucous membrane of the trachea was normal. Solidity of the posterior part of the inferior lobe of the left lung appeared to be due both to cadaveric exudation and to an inflammatory hepatization.

Case 11.—By M. Millard.[3] M. G., aged three years, was brought to his notice on February 20th, suffering with croup in its last stage. She had had scarlatinous anasarca for three weeks, and only complained of trouble in the throat since the day before. When he saw her, the anasarca was well pronounced, she had dyspnœa, and hoarseness of voice. Deglutition still very easy. Tracheotomy was performed in spite of the desperate nature of the case. She died asphyxiated twenty-four hours after the operation.

Autopsy.—Membranous deposit occupied the internal surfaces of both tonsils, the sides of the base of the tongue, and was continued over the two aspects of the epiglottis into the larynx and trachea. It also covered the lateral walls of the pharynx, *and was prolonged into the upper part of the œsophagus for a distance of about* 5 *centimetres* (2 inches). The left half of the anterior face of the œsophageal canal was particularly affected; it was covered by a vertical band of white, false membrane, directly continuous with that of the pharynx.

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[1] Archives Générales de Médecine, Paris, 1824, t. iv. pp. 23–26.

[2] Memoirs on Diphtheria, Syd. Soc. Transl., 1859, p. 76.

[3] Bull. Soc. Anat. de Paris, 1858, xxxiii. p. 87.

The membrane was more adherent in the œsophagus, especially on a level with its upper extremity. The mucous membrane throughout the rest of the œsophagus did not present any alteration except being very pale.

Case 12.—By M. Vidal.[1] He had seen in 1854, in the service of M. Blache, a false membranous tube occupying the entire length of the œsophagus. It was in a case of diphtheria, secondary to typhoid fever. The child was ten years old, and had been sick with typhoid fever two weeks before the diphtheritic complication arose. The uvula, tonsils, and posterior wall of the pharynx were clothed with grayish false membrane. She had dryness of the mouth and great thirst. It was not observed that she had any dysphagia, in fact, the little patient was so far exhausted that she did not seem conscious when she swallowed. She died the next morning.

Autopsy.—The usual characteristic lesions of typhoid fever. The uvula, tonsils, and posterior wall of the pharynx were covered with a grayish false membrane, *which was continued, without any line of demarcation, throughout the œsophagus, forming an internal lining even to the level of the cardia.*

It was exactly moulded to the œsophagus, and about one millimetre in thickness, except towards the cardia, where it became considerably thinner.

Case 13.—By Ogle. He reported to the Pathological Society of London[2] "a case of a tubular cast of the œsophagus, formed of epithelium and exudation matter," which was brought up by a man suffering with cholera. The patient died, but no autopsy was made. The microscope showed the specimen to "consist mainly of a yellowish, amorphous, and granular substance of an albumino-fibrinous character; abundance of oily particles and epithelium mixed with it."

Case 14.—By Klob.[3] A woman, 83 years of age, entered the Rudolph Hospital, Vienna, June 4, 1865, with an ovarian cyst, and died of marasmus. An autopsy was made, and the chief point of interest consisted in the appearance of the œsophagus. The mucous membrane of the fauces and pharynx was normal, *but from the first tracheal ring it appeared as if the mucous membrane and submucous tissue of the enlarged œsophagus, down to the cardia, were changed into a dirty-looking, black-brown, œdematous membrane, 5 to 7 millimetres thick.* This was due, in Klob's opinion, to "a highly intense diphtheritis of the œsophagus," an affection which he says he is unable to find mentioned in literature.

The foregoing cases constitute the more important of the secondary attacks of the affection that I find reported. It is ascertained that diphtheritic inflammation of the œsophagus complicates scarlet fever, pneumonia, and tuberculosis more frequently than other diseases. Ferrand[4] has reported two cases that developed in children soon after recovery from scarlet fever, and in both the superior part of the œsophagus was affected.

Of these 14 cases, 7 were idiopathic and 7 secondary. The diphtheria involved the œsophagus by direct extension of diseased action from the pharynx or larynx in all but 5 cases, 2 of the former class, and 5 of the latter. In Case 3, although false membrane was found lining the mucous surfaces of the mouth, throat, and air-passages, "the œsophageal mucous membrane was implicated in its lower half only." It is possible, of course, that the exudation may have been originally continuous with that of the pharynx and larynx, and that subsequently the upper half became detached and expelled. The deposit, Millard says, first occurred in patches 10 centimetres below the cricoid cartilage, and increased in amount from above downwards until, at the lower extremity, it embraced the entire calibre of the œsophagus. As the stomach and intestines were free from any such deposit, it would appear that the diphtheritic process commenced at the inferior extremity of the œsophageal canal and extended upwards. In Case 6, false membrane existed in the air-tubes, and its presence in the lower part of the œsophagus was evidently due to the traumatic influence of the bougies that had been passed to dilate the stricture at that point. In Case 8, the patient recovered after coughing up a quantity of *dêbris* of false membrane.

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[1] Bull. Soc. Anat. de Paris, 1858, xxxiii. p. 90.

[2] Transactions, 1855, vi. p. 182.

[3] Wochenbl. d. Zeitschr. d. k. k. Ges. d. Aerzte in Wien, 1865, 21 Jahrg. pp. 373–378.

[4] De l'Angine Membraneuse. Thèse, Paris, 1827, p. 14.

It is not absolutely certain that this false membrane came from the œsophagus. Further doubt may be expressed concerning the true nature of the attack from which the patient suffered. As scarlet fever existed at the time in the same household, M. Hennig considered it a case of that disease in which the effect of the poison was concentrated in the œsophagus. Ogle did not say anything about the condition of the pharynx in his patient (Case 13), consequently it is fair to assume that the membrane did not invade this part. Klob (Case 14) distinctly states that "the mucous membrane of the fauces and pharynx was normal," and that the disease began in the first tracheal ring.

The diphtheritic membrane involved the mucous surface of the entire length of the œsophagus, either as a tubular lining or in bands prolonged to the cardia, 7 times. (Cases 1, 2, 4, 5, 10, 12, 14.) In several of the cases it became narrowed at the inferior extremity into a string-like prolongation which reached to the cardiac end of the stomach.

But 2 of the 14 cases expelled a cast of the œsophagus (Cases 1 and 13). The presence of false membrane was demonstrated in the others only by *post-mortem* examination. In the case which I report there were, in fact, two such casts brought up, but the first specimen was destroyed before I could obtain it, in obedience to directions given the family that all expectorated matters were to be instantly burned. The length of the specimen obtained by Ogle is not given. It was expelled by a man who was suffering from fever consecutive to cholera.

Frequency.—While admitting that diphtheria of the œsophagus is rare, may it not occur more frequently than we have been led to believe is the case? Two reasons combine to mask its occurrence:—

1. Comparatively few autopsies are made upon patients who die of diphtheria, except, probably, when such deaths occur in public institutions. In private practice the safety of the living demands the speedy removal and interment of the dead.

2. Because, as far as we can at present judge, the symptoms of the extension of the disease to this locality are by no means distinctive.

The following table gives the number of cases in which the œsophagus was found involved in a series of autopsies performed by different observers upon patients who had died of diphtheria:—

By whom reported.	No. of autopsies.	No. of times Œsophagus involved.	Extent of invasion.	Reference.
Bretonneau,	55	2	Entire length,	Memoirs on Diphtheria, Syd. Soc. Trans., 1859.
E. Wagner,	80	2	Upper part,	Ziemssen's Cyclop., vol. viii. p. 145.
West,	9	2	....	Diseases of Infancy and Childhood, 6th edit. London, 1874, p. 321.
....	10	2	*a.* Some distance, *b.* Upper part.	British Med. Journal, 1859, pp. 305, 326, 348, 380, and 480.
Ch. Talamon,	108	1	Entire length.	Bull. Soc. Anat. de Paris, 1879, liv. p. 180.
Total,	262	9		

The proportion of cases in which the œsophagus was found implicated to the number of autopsies performed by each of these observers varies greatly. The average is about 3½ per cent. The entire length of the tube was affected three times, or a fraction above 1 per cent. Zenker and Ziemssen[1] have met with it twice in a much smaller number of autopsies than that quoted from Wagner (80). Squire[2] mentions its occurrence in two instances out of a list of 74 cases of general diphtheria.

Symptomatology.—Diphtheritic inflammation is so seldom limited to the mucous membrane of the œsophagus that unusual difficulties attend the study of its symptoms. The coincident occurrence of diphtheria of the tonsils, pharynx, or air-passages, in a number of cases, renders it impossible to separate the symptoms indicative of disease of the one part from those of the other.

Greenhow[3] believes that the extension of diphtheria to the œsophagus can be recognized by certain symptoms. These "are extreme difficulty of deglutition, amounting sometimes to total inability to swallow even fluids, followed in some instances by vomiting, as if the disease had extended to the stomach." In corroboration he quotes the observations of Dr. Gull, and also says:—

> "Mr. Stiles, of Pinchbeck, informs me that he has met with cases in which there was difficulty in swallowing without any evident throat affection. He attributed this to the existence of diphtheritic exudation in the lower part of the pharynx, or the œsophagus below the reach of vision.
>
> "In one instance, a patient thought from a sensation of choking that some substance was sticking in his throat, and on passing a probang, shreds of false membrane were brought up on the sponge. Diphtheria existed in the patient's house at the time.
>
> "Œsophageal diphtheria is attended by extreme difficulty of deglutition, often followed in a day or two by pain, either during the passage of food through the œsophagus or after it has arrived in the stomach."

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[1] Ziemssen, Cyclop., German edition, 1878, p. 145.

[2] Manual of Diseases of the Throat and Nose, Morell Mackenzie, M.D., New York, 1884, p. 48.

[3] On Diphtheria, E. H. Greenhow, New York, 1861, p. 112.

Dr. Gull,[1] whom Greenhow quotes, thus expresses himself:—

"In several cases the condition of deglutition (amounting often to total inability to swallow even fluids) indicated that the mucous membrane of the œsophagus was the chief seat of the malady. In the case of a gentleman I saw at Counter Hill, Greenwich, there was scarcely any faucial affection; the disease seemed to be seated principally at the commencement of the œsophagus. The fauces were injected, but there was no exudation; the finger, passed into the lower part of the pharynx, discovered a thickened and obstructed state of the part. Any attempt to swallow even a small quantity of fluid was followed by ejection of it through the nares. The case after a time recovered.

"In another case, under the care of Mr. Burton, of Greenwich, the fauces were not noticeably affected. The principal trouble was difficulty of deglutition, followed (as if by extension of the disease to the stomach) by uncontrollable vomiting and rapidly fatal exhaustion. The abdomen remained soft and rather collapsed.

"From these and other cases it seemed that the diphtheritic process might primarily locate itself upon the lower part of the pharynx or in the œsophagus, and thence extend to the stomach. Unfortunately, in the fatal case alluded to, no post-mortem examination could be obtained."

It is indeed unfortunate, for without an autopsy no grounds existed upon which to base such a diagnosis. "The fauces were not noticeably affected;" no mention is made of any false membrane being visible, and yet, strange to say, the diagnosis of diphtheria of the œsophagus was made because there was difficulty of deglutition, followed by vomiting and death.

Again he says:—[2]

In three instances which I have named, the affection of the fauces, if ever present, had been too slight to arrest attention; in these the chief symptoms were referable to the œsophagus. Two died, one recovered. No post-mortem examination could be obtained."

These three cases were considered diphtheritic, because there was inability to swallow in one case, nearly so in the second, and great difficulty, followed by vomiting, in the third. In one of the cases, it is true, he obtained additional evidence by passing his finger into the lower part of the pharynx and discovering an obstructed state of the part. Setting aside the difficulty of such manipulations, it is probable that Dr. Gull would meet the same obstructed state in the exploration of a healthy throat.

Certainly Drs. Greenhow and Gull possess the faculty of being able to recognize diphtheria of the œsophagus with greater facility than any others who have written upon the subject.

If difficulty of deglutition should ever prove to be such a characteristic symptom of the disease as they represent it, all credit will be due them for having placed it in such a prominent position. Equally open to error is the opinion maintained by these gentlemen that vomiting is presumptive evidence that the disease has extended to the stomach. The gastric mucous membrane has been found covered with false membrane when no symptoms existed during life to direct attention to the part.[3]

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[1] Report of the Medical Officer of the Privy Council, London, 1859, pp. 300–301.

[2] Ibid., p. 305.

[3] Talamon, Bull. Soc. Anat. de Paris, 1879, liv. p. 186.

In order to study the clinical history of the affection, in so far as it is represented by the preceding cases, I have arranged a tabulated statement of the more important symptoms which were mentioned to have been present in each.

Failure to report the cases more fully has prevented the preparation of a more complete table.

Cases.	Pain in Throat.	Dysphagia.	Dyspnœa.	Cough.	Vomiting.	Expectoration of membrane.	Parts involved.
1	None.	No trouble.	Choking sensations.	None.	None.	Two casts of the entire length of the œsophagus.	Posterior nares, pharynx, tonsils, and œsophagus.
2	Pain.	Impossible to swallow.	Increased by efforts to speak.	Frequent.	......	Cast of trachea and bronchi.	Nasal fossæ, pharynx, tonsils, upper half of œsophagus, trachea, and bronchi
3	....	Considerable difficulty; 12 hrs. before death no trouble.	Some.	Excited by attempts to swallow.	Excited by attempts to swallow.	Pieces by cough and vomit.	Pharynx, larynx, and whole of œsophagus.
4	....	....	Died of croup on 5th day.	......	......	......	Mouth, tongue, pharynx, trachea, bronchi, vulva, and lower half of œsophagus.
5	....	....	Croup.	......	......	......	Pharynx, trachea, and deep in œsophagus.
6	....	Some pain in swallowing.	Difficult breathing, paroxysms of suffocation.	Harsh, croupy.	......	......	Tonsils, pharynx, larynx, whole of œsophagus.
7	....	Impossible to swallow.	....	......	......	......	Air-passages, and 1¼ inch of lower part of œsophagus.
8	....	....	....	Tickling and convulsive.	......	Membranous débris by cough.	
9	Pain extended along trachea as far as sternum, accompanied by sensation of tension and swelling	Difficulty in swallowing.	....	Dry; phthisis.	......	Some pieces coughed out during one night.	Palate, tonsils, pharynx, upper ½ of œsophagus, larynx, trachea, and bronchi.
10	....	....	Some.	Cough; pneumonia.	......	......	Nasal fossæ, pharynx, whole of œsophagus.
11	....	Deglutition easy.	....	......	......	......	Tonsils, tongue, larynx, trachea, pharynx, and upper part of œsophagus.
12	....	None.	....	......	......	......	Uvula, tonsils, pharynx, whole of œsophagus.

Dysphagia existed in 5 cases. In 2 of the number it amounted to total inability to swallow. In 3 cases deglutition gave no pain. Dyspnœa was present in 7 cases; cough in 6; vomiting in 1. False membrane was brought up in 5 cases, and in one, at least, it came from the air-passages.

In every case but one, accompanied by dysphagia, the pharynx was invaded by the diphtheritic process, and in four of the five cases the tonsils were also implicated. The exceptional case is number 6, and, in that, the inability to swallow was due to contraction of a pre-existing stricture of the œsophagus. The absence, therefore, of painful deglutition would not exclude diphtheria of the œsophagus, neither would its presence indicate it. Professor Klob, in commenting upon his case (14), says,[1] "During her life no symptoms had created suspicion of any disease of the œsophagus; nay, even the patient had, in the very last days, swallowed fluids without perceptible difficulties." In the case that came under my observation (1), the patient swallowed with facility. Milk was taken in large quantities, and apparently assimilated, and during the latter half of her sickness she was given nearly 500 grams of whiskey each twenty-four hours. Mondière[2] speaks of the impossibility of determining when diphtheritic inflammation has invaded the œsophagus. Its symptoms, if we possess any, are generally masked by those which occur as a result of the implication of the pharynx and respiratory passages. *A priori*, he says, one would be likely to think that pain in swallowing would be most prominent, and vomiting frequent, but such is not the case. Indeed, in a case observed by M. Bretonneau, the frequency of vomiting had given rise to the suspicion that the diphtheritic inflammation had propagated itself from the pharynx to the œsophagus, and possibly the stomach; but these conjectures were proven untrue by the autopsy. Oppolzer,[3] in speaking of dysphagia as an indication of œsophageal disease, states that "too much weight must not be accorded to this symptom, inasmuch as its cause may be altogether outside of the œsophagus on the one hand, and, on the other, because extensive disease of the œsophagus may exist without giving rise to the slightest impediment to swallowing."

Dyspnœa and cough are explained by the extension of the diphtheritic membrane to the air-passages in most of the cases accompanied by these symptoms. In one they were due to pneumonia. In my case no disease of the respiratory passages existed. This *guttural dyspnœa*, according to Bretonneau,[4] is readily differentiated from that due to laryngeal trouble, even when the two coexist in the same patient.

In one of the cases dyspnœa was increased by efforts to speak, and in another cough and vomiting were excited by attempts to swallow. Oppolzer[5] states that "a spasm of the œsophagus will sometimes ensue on attempting deglutition, which, in many instances, will involve the respiratory organs and produce a sense of impending suffocation." The choking sensations, or attacks of short breathing, experienced by my patient were evidently due to swelling of the parts from infiltration, and to mechanical obstruction offered by the presence of false membrane in the pharynx and œsophagus; that in the latter situation probably caused a diminution of the calibre of the trachea by pressing forwards the intermuscular septum forming its posterior wall. Relief was afforded by forcible removal of pieces from the right tonsil and corresponding side of the pharynx. As the exudation returned, the choking reappeared, but it never amounted to that intense dyspnœa indicative of implication of the air-passages. The difficulty of breathing and restlessness became greatest just before the first cast of membrane was expelled. She was immediately relieved and fell asleep, but in less than twenty-four hours the same state of affairs existed and relief was obtained in the same manner.

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[1] Ibid., p. 378.

[2] Archives Générales de Médecine, 1883, 2e série, t. iii., p. 40.

[3] Ibid., p. 277.

[4] Ibid., foot-note, p. 112.

[5] Ibid., p. 278.

Diagnosis.—The diagnosis of diphtheria of the œsophagus is extremely difficult. In most cases it is absolutely impossible to recognize the disease. This difficulty is met with, not only when the œsophageal mucous membrane is primarily the seat of diphtheritic inflammation, but also when it is implicated by extension of the false membrane from the pharynx or larynx. In the vast majority of the reported cases[1] its presence was not suspected until revealed by post-mortem examination. Symptoms, at most, only warrant a suspicion of the existence of the affection. An important indication is the expulsion, by mouth, of bands of false membrane, provided no symptoms exist to indicate that the air-passages are involved. The expectoration of a membranous cast of the œsophagus is the only positive sign of the disease.

The obscurity which accompanies nearly all affections of the œsophagus is well illustrated by the experience of Steffen. Out of 44 cases, including diphtheria, hyperæmia, catarrhal inflammation, ulceration, ecchymosis, and gangrene, the diagnosis was made in only 3: the remainder were found on post-mortem examination.

Sequelæ.—It is claimed by Leube and Penzoldt[2] that cicatrization of diphtheritic ulcers is followed by narrowing of the œsophagus. Zenker and v. Ziemssen[3] have apparently not observed such a result, but say "it must be acknowledged as possible." Dr. Gendron[4] claims to have recognized and taught, since 1837, that such a contraction may occur after diphtheritic inflammation of the œsophagus, and that, in consequence, a dysphagia would be present independently of paralysis of the soft palate or of the pharyngeal and œsophageal muscles. He reports a case that occurred in a man eight days after an attack of diphtheria. Dysphagia was complete; liquids were rejected immediately and provoked a convulsive cough. A gum-elastic catheter was passed with difficulty through a stricture situated below the cricoid cartilage. For twelve days the patient was fed with broth and wine poured through the catheter until deglutition became natural after dilating the stricture.

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[1] Seitz (Diphtheria and Croup, Berlin, 1877, p. 349) observed a case in which there were thirst, dysphagia, and frequent vomiting. These symptoms, he says, occur so frequently in severe diphtheria of the throat that no conclusion was formed, during life, of the participation of the œsophagus in the diseased process; at the autopsy the exudation was found to have extended four centimetres downwards into the œsophagus.

[2] Klinische Berichte von der Medicine, Abtheil. des Land Krankenhauses zu Zena-Erlangen, Besald, 1875, p. 125.

[3] Ibid.

[4] Union Médicale, Paris, 1860–2, s. v. p. 569.

M. Trendelenburg[1] met with a case in a woman, 37 years of age, which developed after an attack of diphtheria at the age of 25. The stricture was dilated with bougies, and when she left the hospital she appeared completely cured. Four or five years later she returned in a very pitiable condition, and was scarcely able to swallow anything. A second stricture was discovered very far down in the œsophagus, which was so tightly contracted that no instrument could be passed through. Deglutition became even more difficult during the following days, and alimentation by rectum was resorted to. Gastrotomy was performed on the 10th of January, 1878. She recovered and left the hospital at the end of August. It was afterwards learned that the patient died, in her native village, of a febrile disease, and unfortunately no autopsy had been made. M. Trendelenburg concludes by saying, "I am, nevertheless, convinced, after the examination of the patient and the progress of the stricture, that it was neither cancerous nor syphilitic, but purely cicatricial."

ARTICLE II.

THE LIMITATIONS OF COLOTOMY IN DISEASE OF THE RECTUM.

By CHAS. B. KELSEY, M.D., of New York.

MR. BRYANT, in his *Harveian Lectures on the Mode of Death from Acute and Chronic Intestinal Obstruction*,[2] has given us perhaps the most important statistics in favor of colotomy recently published. His advocacy of the operation is well known, and his tables seem at first sight to strengthen his position. He lays down the following general rule:—

> "In all cases of cancerous stricture of the rectum or colon, including the annular—which are not amenable to lumbar colectomy or anal excision—right or left lumbar colotomy is strongly to be advocated, with the well-grounded hope of relieving suffering, retarding the progress of the disease, and prolonging life even for five or six years. To secure these advantages it is necessary for the operation to be performed before the pernicious effects of obstruction occur."

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[1] Traité de la Gastrostomie, Dr. L. Henri Petit, Paris, 1879, Case XLI., pp. 261–265.

[2] Brit. Med. Journ., Nov. 22, 1884, *et seq.*

This rule seems to me entirely too broad in its application to be a good guide in practice. Colotomy is a grave operation, as will be shown from Mr. Bryant's own statistics. No one cares to undertake it for the mere sake of doing it, unless it holds out a fair prospect of prolonging life and relieving pain to a degree sufficient to counterbalance the danger of immediate death and the subsequent discomfort which it involves; and in deciding for or against it in any individual case these two factors should be allowed their full weight. Take now the following cases:—

Case I. *Cancer of the Rectum; Death from Perforation.*—The patient, a young man of 30, was first seen by me in March, 1884, at which time he gave the following history: Until within a year his health had been perfect. Since then he had suffered a good deal from attacks of pain in the abdomen accompanied by diarrhœa. He was in bed with such an attack at the time. The abdomen was a little distended with gas, and there were localized pain and tenderness over the caput coli. He was kept in bed for a few days with milk diet, bismuth, and morphia, and the symptoms passed off; but only to return again after a few days as they had done before; this time, however, without the signs of typhlitis.

An examination by the rectum was so nearly negative that beyond a diagnosis of intestinal catarrh I preferred not to commit myself to any decided opinion even in my own mind. All that I could find out of the way was a marked hardening of the prostate, and a suspicion of increase in size. The change was not sufficiently marked to justify a positive statement that there was anything abnormal, and the patient went to Cuba for a month. He returned feeling better in general health, but with the same diarrhœa.

A second examination showed well-marked scirrhus in the region of the prostate. The tumor could be distinctly marked out with the finger, was the size of a small egg, and projected sharply into the rectum, so sharply that when the finger was introduced it came directly against it, and had to be turned well toward the sacrum to pass by it. My diagnosis was given to the patient's friend, and was confirmed by Dr. Keyes, who made a careful examination with finger in the rectum and sound in the bladder, thus marking out distinctly the whole of the disease.

Although the growth encroached somewhat upon the bladder, there was an absence of any marked vesical disturbance. The patient complained greatly of pain in the region of the tumor, and the diarrhœa continued unchecked. The act of defecation was painless, the passages were watery and mucous, and the general health was well sustained.

Seven months after first seeing the case a note was entered that he was gradually losing ground with the usual symptoms, but no marked change occurred till just a year from the time the tumor was first found, when he had the first symptoms of obstruction. These came on gradually. The diarrhœa at first changed to obstinate constipation, which could with difficulty be overcome by laxatives. The abdomen became distended, the coils of intestine were distinctly visible, and there was much gurgling of gas and fluids. The passages consisted of a drachm or two of mucus and a little blood. By the free use of a pill of belladonna, aloes, and strychnine for two or three days, followed by a saline, the bowels could be induced to empty themselves about once a week, but the constipation was as marked as ever on the following day. This condition lasted nearly a month.

The patient's general condition continued good, the pain had disappeared in the pelvis, and was only such as was caused by the distension of the bowels; and he was at times able to go around for two or three days at a time. There was little change in the size of the growth, and the exact cause of the obstruction began to be a question of interest, for the mass alone was not large enough to obstruct the rectum. The finger could easily be passed beyond it, and a bougie the size of the little finger could be passed the whole length.

Suddenly, and when the patient seemed doing better than for a month past, the obstruction became complete. I had already offered him the chances of prolonging life which might reasonably be expected from colotomy, and he had decided against it. For my own part, I advised neither for nor against it, but simply explained all the bearings of the case as far as lay in my power, and was glad when he decided in the negative.

The question of operation being eliminated, every effort was made to overcome the obstruction in other ways. The treatment was begun by absolute rest in bed, restricted diet, and belladonna. The latter seemed powerless for good even in doses which caused decided delirium. One half a grain of the extract repeated every four hours was well borne for two days; but after that, and indeed during the remainder of the case, a single grain caused a mild delirium with horrible visions, and it was finally abandoned entirely.

Morphine in large doses was substituted after the second day, the diet was reduced to the lowest possible point compatible with sustaining the vital powers—half a pint of bouillon every eight hours—and both massage and electricity were used over the abdomen. On the fourth day the two latter methods of treatment were abandoned, and the sole reliance was placed upon morphine, rest, and diet. The morphine was carried to the point of somnolency and kept there. On the eighth day there was a discharge of wind, which soon became very abundant. Later on the same day the fluid stools began to appear, at first small in quantity, but finally more abundant, and he was relieved. He passed no solid matter, and there seemed none to pass. The abdomen went down one-half, the distended coils disappeared, and the patient was able to go about a little.

This improvement continued one week, during which he lived very carefully on a restricted diet of coffee and toast for breakfast, beef-tea for lunch, and a light meal of soup and fish for dinner. On the seventh day he was sufficiently improved to walk out for a couple of blocks. On the following day the passages again ceased suddenly and absolutely, but without other symptoms. This was April 4th, and the same treatment was followed as before—morphine, rest, and restricted diet with whiskey—but without avail. The abdomen was immensely distended, but there was little gurgling. There were occasional passages of mucus, but no fecal matter. The pulse remained steadily at about 80, the temperature under 100°, and the urine was passed normally. The respirations were kept down to about 12. On the eleventh day of the attack there was a decided change in the character of the passages, indicating sloughing of the mucous membrane. The mucus became more bloody instead of being clear, and the discharge resembled very strongly that which comes from the wall of an abscess after most of the pus has been evacuated. The patient also began to vomit dark, brownish fluid, but having no fecal odor. The pulse at this time ranged about 100, and there was no other change. On the thirteenth day I saw the patient at 9 A. M., and there was no change. At noon his nurse had noticed no change; there had been no pain; he had slept most of the morning, and there seemed no outward change to my own eye, but the pulse had risen, between the two visits, from 100 to 130. So strongly was I convinced that perforation had taken place quietly, and probably during sleep, that I telegraphed for his friends. About an hour after he had an attack of the most intense pain in the right side, with marked collapse. It was impossible to keep him still, the agony was so great, and morphia in grain doses every half hour made no impression. The sudden pain indicated to my mind the commencement of extravasation. He died in collapse five hours after the pain began.

Autopsy.—The distension of the abdomen was due chiefly to the colon and caput coli, the former being from six to eight inches in diameter. There was considerable fluid in the peritoneum, and many small cancerous nodules spread through the omentum. The perforation had taken place in the ascending colon about four inches from the valve, was large enough to admit the thumb, and there had been considerable extravasation of fluid feces. The real cause of the obstruction was a secondary deposit in the sigmoid flexure which had never been detected during life, though often carefully examined for. It caused no visible tumor even when looked at in its natural position, but when the bowel was taken in the fingers its calibre was almost completely filled with scirrhus.

This was a case of great interest to me—an interest due in part to the gentle character of the man, whose promising life was thus cut short at the early age of thirty—and in part to the important question of treatment which I was called upon to decide. There were many points in the case to which I might call attention: the peculiar location of the growth; the entire absence of all vesical symptoms from a growth in such location; the impossibility of telling what was the cause of the obstruction; and the certainty with which the results of that obstruction could be predicted and recognized when they came. But all these points were of minor importance to the one question of treatment.

The diagnosis was made early. For a whole year I had a chance to do colotomy on that man under what seemed to me exceptionally favorable circumstances. There was no time when he would not have been guided absolutely by my advice, and yet I refused to recommend the operation. I went further than usual in offering to do it if he desired it, but I refused to guide his decision. And yet, up to the time when obstruction became absolute, the case seemed one of the most favorable for that operation I have ever seen. The patient was young and in good condition; the growth was slow and seemed likely to be slow; any other surgical procedure was out of the question from its position; it seemed that a simple opening of the sigmoid flexure above the growth, which could be felt, would prolong life perhaps several years, and, above all, I could have selected my own time for operating and operated early. Even at the last I was rather inclined to the belief that the obstruction was of the nature of a volvulus in the sigmoid flexure, caused by the violent effort of the intestine to force its contents past the tumor, and that even then life might be prolonged perhaps a couple of years by opening the descending colon.

Suppose, now, a colotomy had been done, how much would have been gained? The diagnosis, though correct, was not complete. The growth in the sigmoid flexure was only suspected, the generalization of the disease all through the omentum not even that. Up to the time when perforation occurred there was no pain which could not be relieved by morphine, which the patient used according to his own needs, being urged to take it freely. It seems safe to say that, without regarding the immediate danger of the operation, it could hardly have prolonged life to any extent. Even if it had, is life, under such circumstances, so much to be desired? This is a question no surgeon can answer for his patient; but this patient, being a man of intelligence and nerve, answered it for himself. He thought not.

Take now the following cases :—

CASE II. *Cancer of Rectum; Ascites; Death.*—Woman, aged 48. This patient gave a history of being sick for about six months. There had been some diarrhœa without blood, some pain in back and loins, and some loss of flesh. For the past month the emaciation had been marked and the abdomen had been increasing in size, while a tumor the size of an egg had been felt in the right lower abdominal region which was painful on pressure. This had disappeared before I saw her. On examination the cachexia and emaciation were very marked. Ascites moderate but very apparent; marked tenderness in left iliac region and over liver; enlargement of glands in both groins; no signs of intestinal obstruction. The uterus was firmly bound down; there was marked tenderness at upper end of vagina on left side; and the rectum showed a fungous mass of cancer at the limit of digital examination, together with a hard mass behind the uterus. The diagnosis was cancer of the rectum, possibly also of uterus, and probably of liver. I declined to do colotomy, and made the patient's way to the grave as easy as possible by other means. There was at no time any marked signs of obstruction, the diarrhœa becoming more and more marked toward the end, and she slowly sank and died in three months and a half from the time of the examination, with all the signs of visceral cancer, but without any marked intestinal obstruction. Her last weeks were made comfortable with morphine, and at no stage of the case did there seem any indication for colotomy.

CASE III. *Cancer of Rectum and Uterus; Death.*—Mrs. M., aged 55. Gives history of bloody passages, pain, and diarrhœa, lasting for one year, with occasional free discharges of blood from the vagina; is emaciated and cachectic. Examination showed cancer of cervix uteri and body of womb, and cancer of upper part of the rectum through which the finger could be passed, and which allowed of the free discharge of feces. She was treated with laxatives and tonics; when necessary, which was not very often, opium was administered; and she gradually sank away, being exhausted by frequent and severe hemorrhages.

In neither of these two cases did colotomy seem indicated or indeed justifiable. In neither would it have prolonged life, though it might materially have shortened it in both. On this point Mr. Bryant's statistics are very instructive.

Out of 60 cases for cancer 26 died within the first month, and 18 within the first week. These he collects together under the heading of "Too Late Cases." Why? Except in two cases where complete obstruction is mentioned to have existed for weeks, and in two others where the bowel was found ruptured above the stricture, no reason appears in the history of the cases as given. Is it to be concluded that, in every fatal case dying within four weeks of the operation, the result is because the operation was done "too late"?

Did the cases die of the disease in spite of the operation, or of the operation itself? The arbitrary character of this thirty-day limit is shown plainly by the fact that in the first table of "too late cases," or those that died *within* 30 days, one is recorded that sank on the 27th day; and in the second table of cases that recovered from the operation one is reported that sank *on* the 30th day.

From a mere table of cases without any histories except the most meagre facts it is of course impossible to tell what reasons Mr. Bryant may have had for judging that these cases were all operated upon too late except the fact that they died from the operation. Doubtless they were good ones. If good ones, they should be evident before operating, and if so why operate? In only a few cases does the *post mortem* seem to show that the operation was too late; in almost all it would seem that the condition was as well known before as after death. Take the numerous cases which are marked as follows: Stricture of rectum, sank on 2d day, sank on 4th day, sank on 5th day, etc. There is no reason to show why they sank. Would none of them have died had the operation been done sooner? The criticism on the group is simply this: If in these cases the constitutional or local state was such that before the operation it could be said, if this case dies it will be because the operation was done too late, a good many surgeons might hesitate to take the risk of shortening the unknown number of days or weeks which might still have been left to the sufferer who must soon die at any rate. If, on the other hand, the condition was such that the chance of recovery seemed good and yet they died, may it not be asked whether the death cannot fairly be attributed to the fact that the operation was done at all?

There is another way of looking at this table. Eighteen cases of cancer of the rectum died within a week of being operated upon, and twenty-six within the month. What is the total number of days of life which were lost by an attempt to gain more? How long might any one of them lived if not operated upon?

Passing now to the 34 of the 60 cases that recovered from the operation: concerning these, Mr. Bryant makes three claims, some of which will be admitted readily enough, others not so readily. His second one will pass with the least question: that the operation relieves the pain caused by the passage of feces through the narrowed and probably ulcerated lumen of intestine, and the ineffectual efforts of the bowel above to pass on its contents. In certain cases this is undoubtedly true, but in cancer of the rectum the passage of feces often causes little pain to the end. Not in every case, by any means, do we find either much ulceration or any obstruction. The disease may run its course, become generalized, and kill, before a scirrhous mass will ulcerate or cause stricture. In such a case the pain is not due to the passage of feces over the disease, or to the act of defecation itself, and can scarcely be relieved by colotomy. In any case in which the condition mentioned obtains a sufficient extent that colotomy with its risks of immediate death and its subsequent annoyance is considered preferable, the operation is certainly indicated provided nothing else is believed to be as good or better. Among the 34 cases we find a few where this condition is plainly stated. Case 6, "extensive rectal ulceration supposed to be cancer and stricture;" 7 and 14, "cancerous stricture of rectum and anus with fecal fistula;" 9, "cancerous stricture of rectum with recto-vesical fistula." In none of the others can we judge of the exact condition except by the diagnosis of cancer.

Another point claimed by Mr. Bryant is that colotomy retards the progress of the disease by removing from its presence a source of irritation, the passage of feces. His opinion on this point is of the greatest value, and will go far to offset the opinions of those who disagree with him, but, with all respect, is it not simply an opinion, and how can the matter be proved? At first sight the statement would seem reasonable and probable, but to get any further than this is exceedingly difficult. A sufficiently large number of cases carefully selected as bearing on this special point might be of help by enabling us to deduce an average duration of life; but the cases would need to be selected ones. Not every case of cancer of the rectum would serve for this purpose, but only those in which the passage of feces plainly served as a source of irritation. From these would need to be deducted all those in whom colotomy was fatal within a short time as not bearing on the question. The remainder might be compared as to length of life with an equal number of the same class of cases on which no operation had been done, and the result would have a certain scientific value, and yet would be of very little use as applied to any particular case. This I believe has never been done, and it is perhaps not too much to say that the question whether colotomy does retard the growth of cancer of the rectum is still a question.

Mr. Bryant's third point is that colotomy prolongs life, "probably for one or two years, and possibly for four or five years," and at the same time saves the patient from a painful and miserable death, that from obstruction; whilst, at the same time, it leads the patient to his last home in as painless and quiet a way as can be desired. There is much truth in this, and yet it is well to see just how much. In the second table of 34 cases of cancer, 8 left the hospital convalescent, and the length of life after the operation is not stated; and one was alive five years after, but upon this one Mr. Bryant himself casts a doubt by entering the diagnosis as "supposed cancer of the rectum. Symptoms 18 months. Blood and mucus," so that it probably would not be wrong to drop it out; thus leaving 25 cases in which the length of life is known. Of these 25, 9 died within six months, and 16 within a year, while 4 more dropped off within 18 months. There is one case of 21 months, one of 26, one of 33, and one of 41. This, it must be borne in mind, is in selected cases, in those in whom the operation was not immediately fatal. The bad cases (nearly 50 per cent. of the whole) are thrown out beforehand.

Do these figures justify its being accepted as a rule that in cancer of the rectum colotomy prolongs life probably from one to two years, and perhaps four or five? Out of 60 cases, 18 are dead in a week, 26 in a month, 35 in six months, and 42 in a year, 8 are not followed up, and 1 is doubtful in diagnosis.

It still remains that in certain cases colotomy will do all that Mr. Bryant claims for it. It will prevent death from obstruction, and it will give great relief from pain. It is a most valuable palliative measure in some cases of cancer of the rectum—cases beyond the reach either of excision or division, and in which all other measures have failed. At the same time it is a dangerous operation, and it is by no means proved that it prolongs life in any other way than by avoiding or relieving obstruction in those cases (and they are only a certain definite proportion of them all) in which obstruction occurs.

To go back to Mr. Bryant's original proposition that colotomy should be done in all cases "which are not amenable to lumbar colectomy or anal incision." Not stopping to discuss lumbar colectomy (which, the last time we heard of it, had been done ten times, with five immediate deaths as a direct result of the operation,[1] and which, in a certain number of selected cases, seems to hold out a goodly chance of giving relief), what becomes of the operation of proctotomy? Is not this yet a recognized surgical procedure? Take the following case:—

Case IV.[2] *Cancer of Rectum; Proctotomy.*—Married woman, aged about 55, subject of extensive cancerous disease of the rectum. Had already had one attack of fecal obstruction, which was very nearly fatal, before I saw her, but was finally relieved by laxatives. The disease was scirrhus, began within the sphincter, and so completely closed the bowel that no passage could be detected by the finger. By vaginal examination it was found to extend as far as the finger could feel. The patient had been under treatment two years before I saw her, and the disease was probably of longer duration. Her general condition was still good, there was no abdominal distension, and I determined to attack the disease *in situ.* This was done with Paquelin's cautery.

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[1] Kelsey, Diseases of Rectum and Anus. N. Y., Wm. Wood & Co. Ed. of 1884, p. 357.

[2] Previously reported in part.

The operation was long and difficult. The sphincter was first burned through down to the tip of the coccyx, and the rectum held open with retractors. The growth itself was next attacked at the place where a slight depression seemed to indicate the passage must be, and I soon had the pleasure of entering with the knife a considerable cavity in the rectal pouch surrounded on all sides with scirrhus. Above this the gut was again so completely occluded that no passage could be discovered, and the operation consisted simply in burning through the mass in the dark, being guided solely by the natural course of the rectum in health, and keeping well toward the sacrum.

The operation lasted more than three hours. It seemed towards the end that the disease might run too high for the upper limit to be reached, but the knife finally entered a cavity which it was a great relief to discover was the dilated rectum, and not the peritoneum, as I half suspected it might be. The remainder of the operation consisted simply in enlarging the passage thus made by burning away as much tissue as possible, and when finished two fingers could easily be passed.

Not an ounce of blood was lost, the parts were dressed with a cold compress, and the rectum kept clean by the use of injections of chloral in water twice a day. After the third day the bowels were encouraged to act by laxatives, and did so with surprisingly little pain. On the tenth day there was a smart secondary hemorrhage, which, however, ceased spontaneously after the patient fainted. This was the only accident, and in a few weeks the patient was again about her daily duties, more comfortable than she had been for a long time. The comfort continued till the time of her death, eight months after the operation. The death was due to a slow process of exhaustion, and not to obstruction.

Here we have a case certainly not amenable to either lumbar colectomy or anal excision, and yet if it had been in Mr. Bryant's table it would have helped up the favorable statistics of colotomy—provided it had not "sank" on the 2d or 5th day. The woman was saved from immediate death, lived in comfort eight months, and died in comparative ease. Can colotomy show any better average result? If not, every reader may choose between her condition and that of a patient with an artificial anus in groin or loin.

Mr. Bryant's second proposition is that

> "Lumbar colotomy is valuable as a curative operation in syphilitic and simple ulcerations of the bowel which resist other treatment, including cases of recto-vesical fistula; and it is remediable in examples of volvulus of the sigmoid flexure, as well as of obstruction caused by tumors."

This statement does not admit of argument. In his table of colotomies for non-cancerous disease, such as syphilitic stricture and ulceration, obstruction from pelvic tumors, and recto-vesical fistulæ, the results are much better, and there is much less ground for discussion. In these cases the operation is often curative, and moreover, it is often the only method of relief. We point out only the high death-rate, 7 cases in 22, and then ask attention to some of the "other methods of treatment." Recto-vesical fistula is left out of the question, all that Mr. Bryant claims being freely admitted. Take now the following case of pelvic tumor :—

Case V. *Pelvic Exudation Occluding Rectum.*—Mrs. S., aged 50. Had pelvic cellulitis and peritonitis four years ago, since which has always suffered greatly from pain. About one year ago began to notice increasing trouble with the bowels. The constipation became marked and troublesome, so that she never had a passage of any amount without medicine. There was blood in all the stools, sometimes in considerable quantity, and a bloody and mucous discharge in the morning attended by pain, tenesmus, and a constant desire to relieve the bowels, which she never seemed able to satisfy. The patient was weak, emaciated, and nervous.

An examination showed a hard mass between rectum and uterus, which by its pressure almost completely occluded the former. This mass, though easily felt by the finger in the rectum, was absolutely immovable and unyielding to any amount of force which it seemed safe or even possible to apply to it with finger or bougie. The tip of the finger could be introduced between it and the sacrum, but could not be forced any further. Above this point there was a considerable accumulation of feces, and the usual ulceration and dilatation found associated with stricture.

The patient was suffering from chronic intestinal obstruction. All attempts to pass a bougie beyond the obstruction had failed; nevertheless, I determined to try what could be done to produce absorption of the mass and restore at least a portion of the lumen of the bowel. Without very much difficulty I succeeded in passing the smallest sized soft-rubber bougie at her second visit, and from that time on the progress was quite satisfactory. The treatment consisted in the passage of a bougie twice a week, the administration of laxatives to secure daily passages from the bowels, the regulation of the diet, and support of the general health. I succeeded after a time in unloading the bowel above the stricture and in keeping it from filling a second time; and at the end of four months a No. 7 bougie could be passed, and the patient was having daily well-formed passages often the size of the index finger. Beyond this point dilatation seemed impossible, the mass being absolutely unyielding, and recourse was had to two other therapeutic agents, hot water and galvanism. Skene's rectal irrigator was introduced as far as the obstruction every other day, and from three to four gallons of water used. The patient would bear without discomfort water too hot for the hand to bear, and the effect was good. She is still under treatment.

In this case there were but two lines of treatment to be chosen from: one, that which was followed; the other, colotomy. The idea of cutting into the tumor and trying to enlarge the passage in this way did not seem feasible. When first seen colotomy would certainly have been a justifiable and proper mode of treatment, and had the other not succeeded it would have been resorted to and would have given relief. Still, I doubt whether the relief would have been any greater than that which followed the other plan. The patient is far from well now. The ulceration is still present and causes the usual symptoms, and there is small chance of curing it, but she is in no danger of obstruction; there is sufficient opening for the bowels to relieve themselves, and from the nature of the obstruction recontraction does not seem probable. In fact any change in the tumor itself as time goes on will probably be in the nature of absorption, and hence be beneficial. The patient is comfortable, is able to attend to her household duties, to go out, and to enjoy life; and with proper care will probably continue so. I may in the end be forced to do a colotomy, but I do not expect to. Meanwhile she is much better off than she would be with an artificial anus.

The following case is also an example of some of those other means which may be used besides colotomy in cases of non-malignant ulceration.

CASE VI. *Ulceration and Stricture of Rectum; Fecal Fistulæ; Division; Cure.*—This woman had suffered so much, and was in such a reduced condition, that she was sent to me for the express purpose of having a colotomy performed. The disease may have been syphilitic, or it may have been simple. I never could decide; but the ulceration involved the whole circumference of the lower three inches of the rectum, and had resulted in a tight stricture about two inches up, with two fistulæ. It had been nicked more than once, and dilatation had been practised until it could no longer be endured. The patient was much emaciated; in a very depressed and nervous condition; never had a passage when she could avoid it on account of the suffering, and could not bear the introduction of the finger without ether. The stricture was cut, with everything below it, down to the tip of the coccyx; the fistulæ were laid open at the same time and the ulcer scraped over, and touched in parts with nitric acid. She immediately began to improve, and now, four and a half years after the operation, considers herself comparatively a healthy woman, though she uses a bougie upon herself twice a week. There is still a little ulceration, and a little discharge; but after the bowels have moved in the morning she has no trouble for the rest of the day, and she has no pain at any time.

Had this result been obtained by colotomy, it would have been considered an exceptionally favorable one. It was obtained by means much less dangerous and infinitely preferable.

I do not wish to be considered as arguing against colotomy *in its place.* And in closing let me say that while Mr. Bryant has so ably shown from his own large experience what can be done by colotomy, I have simply tried to show what can be done in a few cases without. His article is one of the most valuable contributions to the subject ever made, and cannot fail to be so considered and prized accordingly. It is far from my purpose to criticize the article, or to detract from the value of one of the certain means by which the pain of an incurable disease may be alleviated, and a life sometimes prolonged. In emphasizing one method of treatment, Mr. Bryant has not, in his own mind, or his own practice, slighted others; but it is possible that this may not be the effect upon some of his readers. Colotomy is a much more attractive surgical operation than keeping up gradual dilatation for a number of years, especially in dispensary practice, but because Mr. Bryant has found 82 cases in which it was necessary, it is not proved to be either necessary or suitable in the first case of rectal stricture met with by another. Take, now, the following cases:—

Case VII.—Mrs. N., aged 38. In this case there was a full syphilitic history, and the stricture, which had existed ten years, was probably of syphilitic origin. It was located two inches from the anus, was very tight, but not of very great extent. Above it there was a good deal of ulceration with the usual symptoms. She had been operated upon three times by nicking, each time with temporary benefit. Refusing a more radical operation by proctotomy she was treated by gradual and progressive dilatation until the stricture easily admitted a full-sized bougie. Applications of iodoform and of strong solutions of nitrate of silver were also made to the diseased surface above the constriction. After two months of this treatment the patient was having one full-sized, natural, painless passage once a day, and he ceased attendance, probably to return in a year or so as bad as before.

This is one of the cases in which I believe colotomy may almost be said to be absolutely unjustifiable; other and milder measures being amply sufficient for the relief of the patient.

Case VIII.—Mrs. B., aged 38. Gives a history of rectal disease dating back eight years, but no syphilitic history can be obtained. During the nine years of married life before the rectal symptoms began she had five healthy children, all of whom are now alive. Has never had a miscarriage. She was greatly emaciated, the kidneys were diseased, and she seemed to be nearing the grave. On examination the whole anal region and both buttocks were found to be extensively diseased. They were brawny, hard, infiltrated, and full of fistulous openings from which pus escaped on every movement. The pressure of the finger on the right side caused an escape of pus from the openings on the left, and *vice versa.* There was a large abscess cavity on each side of the anus filled not only with pus but with stercoraceous matter, and I counted fourteen separate fistulous openings, some of them outside of the trochanters. The anus was so surrounded by cutaneous tags that it was difficult to locate it, and the finger in the rectum encountered a stricture involving all of the rectum within reach, but of sufficient calibre to permit the passage of the index. The nature of the stricture was difficult to determine, but it bled freely when touched, and seemed more probably cancerous than anything else.

In this case colotomy was advised, but little hope was held out of a successful issue, and the patient disappeared, rather to my relief. Had she been in better condition generally, had there been no waxy kidneys, I should certainly have attacked the disease locally, first doing a proctotomy, and subsequently operating on such of the fistulæ as refused to close. But the sufferer was to my mind too far gone to render any operative measure at all desirable, and she probably died within a very short time of my seeing her. The patient was a poor woman in the lower walks of life, and was one of a large class who by simple neglect sacrifice all hope of relief. It was a case eminently amenable to treatment up to the time when on account of the general condition the treatment bid fair to shorten rather than lengthen life.

Case IX. *Cancer of Rectum.*—Male, aged 31. The symptoms had lasted nearly two years, and he had lost forty pounds of flesh within a few months. Although there was a full syphilitic history, the diagnosis of cancer was made by both Dr. Keyes and myself. On the day before I saw him he had for the first time had some symptoms of obstruction. On examination a mass of scirrhus was found surrounding and nearly occluding the rectum at about three inches and a half from the anus. He was still in good condition, and the choice of operation lay between colotomy and proctotomy. I advised the latter, but the patient left the city without having anything done, and when heard from, a few weeks later, was slowly dying.

CASE X. *Cancer of Rectum; Excision; Death.*—Male, aged 55. Symptoms of rectal disease for eighteen months. Examination showed a circumscribed growth on anterior wall of rectum about three inches from anus, which could easily be removed by écraseur. No other disease was found, and the patient's condition was good; the growth was therefore removed. He sank and died on the third day. *Post mortem* showed much more extensive disease than had been anticipated; the whole sigmoid flexure being involved.

In this case colotomy might have been of some use; excision certainly could not have been.

CASE XI. *Cancer of Rectum.*—Miss A., aged 52. Began to notice blood in passages four years ago, with some protrusion at stool. Has not had much pain; there is some emaciation, but the general condition is still good. On examination the patient by straining brings down and out of the sphincter a large cauliflower growth which surrounds the bowel anteriorly and on each side at about three inches from the anus. The whole mass is extruded in each act of defecation and bleeds freely, but is easily reduced by the patient. There is no contraction, and whatever obstruction there is is due merely to the presence of the soft mass projecting into the rectum. An excision was advised, and the patient returned to her attending physician.

What, then, are the indications for colotomy?

1. In congenital malformations of rectum or anus in children in which a tentative operation in the perineum has failed to reach the rectal pouch.
2. In intestino-vesical fistulæ.
3. In tumors occluding the rectum which cannot be relieved by any other means—dilatation, division, hot water, or electrolysis.
4. In non-cancerous, simple or specific stricture and ulceration of the rectum (with or without fistulæ), where the disease cannot be relieved by proctotomy or dilatation, or division of the fistulæ and local treatment of the ulceration.
5. In cancer where the disease can neither be removed nor the passage re-established, and where death is probable from obstruction—except in cases where the immediate dangers of the operation more than counterbalance any good likely to be gained by it.
6. In volvulus or intussusception of the colon or sigmoid flexure, where reduction by the aid of laparotomy has been found impossible.

THE MADISON, 25 Madison Ave., N. Y.

ARTICLE III.

AN EXPERIMENTAL RESEARCH UPON THE INFECTIOUSNESS OF NON-BACILLARY PHTHISIS. By E. L. TRUDEAU, M.D., Saranac Lake, N. Y.

AMONG the facts which must still be explained before Koch's bacillus can be unequivocally accepted as the sole and direct cause of tubercular disease, none, perhaps, needs elucidation so much as the undoubted occurrence of what may be called non-bacillary phthisis. I do not here refer to those chronic inflammatory conditions of the lungs which are the result of some distinct and thoroughly appreciated irritation, such as nailers' and stonecutters' phthisis, but to the undoubted occurrence, as acknowledged by Koch, and insisted on by Formad, Prudden, and others, of a small proportion of typical phthisical cases whose expectoration during life is found at all times free from bacilli, and in whose tissues after death, though many lesions morphologically identical with tubercular disease are present, the most careful research fails to reveal any of Koch's specific micro-organisms. Experimental research into the nature of these cases has seemed to the writer of special interest, because they are as yet so little understood, and here we can procure material from an apparently phthisical source yet free from the micro-organism upon which the causation of tubercular disease is claimed to depend.

It has been pretty clearly shown that the bacillus does produce tuberculosis in animals even when separated by culture for many generations from the pabulum in which it is originally found, but exact knowledge as to the effect of inoculations with the pabulum itself when free from those organisms is a link yet missing in the chain of evidence which from all sides now tends to inculpate the bacillus.

Though Sternberg has shown that tuberculosis cannot (as was once believed) be induced by the introduction into animal organisms of finely divided particles, yet the possibility of producing it by inoculation of material taken from patients presenting all the familiar symptoms of phthisis, after such material had been shown to be free from bacilli, seemed to the writer worthy of trial. The object, therefore, held in view has been simply to demonstrate whether non-bacillary phthisical sputum possesses any infectious qualities. If, on the one hand, it were found to produce tuberculosis in the animals operated on, then the bacillus could not be accepted as the sole cause of this disease; if, on the other, no constitutional infection resulted from such inoculations, the evidence thus procured must tend to strengthen the sinister claims of Koch's micro-organisms, and strongly suggest the duality of phthisis.

The first step was to find a patient presenting all the rational and physical signs of confirmed phthisis, whose expectoration should, at all times, be found free from tubercle bacilli. Thirty cases were examined before one meeting all the requisites was encountered. The methods employed were Ehrlich's and Koch's modification of Ehrlich's, preference being given to the methyl violet over the fuchsin stain.

In 21 of these 30 cases the bacilli were demonstrated in the first slides examined; in 8 cases, repeated research, extending in two instances over two weeks, was necessary before the presence of the microbes was satisfactorily ascertained, while in one only did constant and careful examinations, carried on for over a period of two months, meet with entirely negative results. No precaution was neglected which would give the assurance that no bacilli were at any time present in the expectoration of this patient. Twenty examinations, from one to four days apart, were made before the material to be used was collected, and occasional observations were continued nutil the experiment had been concluded. The sputum was evidently non-bacillary and remained so throughout. The microscope always showed, in varying proportions, pus-cells, blood-corpuscles, epithelium, from the mouth, and some granular matter, with occasionally a few elastic fibres; the usual putrefactive bacteria found in similar material were not seen, having been decolorized by the nitric acid used. A history of the case is appended in note form.

Bearing in mind the danger of external contamination, as demonstrated by Sternberg's researches, every precaution was taken to guard against such an accident. The sputum was collected in a sterilized bottle with a sterilized cotton plug, and the injections were made with a previously sterilized (by heat) asbestos packed hypodermic.

The animals selected were twelve full-grown rabbits. Four were inoculated with bacillary sputum from a patient with chronic phthisis; four with the expectoration of a healthy person attacked with acute bronchitis; while the remaining four were injected with non-bacillary phthisical sputum from the case selected. The punctures were made in the anterior chamber of the right eye and on the left side of the neck at the same time, and on these places from one to two drops of the morbid material were deposited. The entire mass of infecting material was invariably thoroughly mixed by being subjected to the action of a sort of egg-beater (sterilized by heat), rapidly revolved by means of a multiplying crank. The animals were then kept entirely separate under the best possible conditions with respect to food, light, and air. The bacillary ones were killed two months after inoculation; both of the other lots a little over three months from the time of injection. In the animals injected with bacillary sputum the results were much the same as found by other observers; in each case one or more caseous abscesses of good size were present at the point of puncture in the neck, and tubercular iritis or cheesy abscess on the eye operated upon, enlarged cervical and axillary glands, swollen lymph-ducts, and in one instance a nodule or two in the lungs and liver. The enlarged glands looked like common hyperplastic glands, but in the largest the microscope revealed evident tubercles. In every case at the point of inoculation, and in a few of the more advanced lesions, tubercle bacilli were easily demonstrated. Had the animals been kept longer, the lesions would evidently have soon become more extensive.

In the four rabbits injected with the sputum of simple bronchitis, and killed three months after inoculation, the results were as follows: One rabbit was accidentally injured two weeks from the beginning of the experiment and died in consequence; of the three remaining ones, one only showed entire absence of any lesion, the points of puncture even having become entirely effaced. In the third animal a very minute cheesy abscess remained in the neck and an enlarged gland in the axilla; this enlargement proved, however, purely hyperplastic, no tubercles or cheesy foci being made out. In the fourth rabbit two minute yellowish spots remained on the neck under the subcutaneous tissue, and some opacity of back part of cornea on the anterior chamber; all the organs were healthy. The most thorough search failed to reveal any bacilli in any of the slight lesions, though all were examined.

The results of inoculation with non-bacillary phthisical sputum are given somewhat more in detail.

Animal No. 1.—Inoculated March 7, 1885, on left eye and right side of neck with non-bacillary phthisical sputum. April 21. Only slight scar in cornea visible, no change whatever in iris. June 8. Rabbit killed and found in excellent condition. Nothing whatever abnormal can be detected in the eye; in the neck the point of inoculation is made out with difficulty as a minute yellowish spot. Stained sections show no bacilli; all the organs perfectly healthy.

Animal No. 2.—Injected March 7. Same as No. 1. April 22. Cornea opaque, with yellowish spot in centre of pupil; no enlargement can be felt in the neck; animal killed June 9th. Cornea found opaque, with adhesions to iris; sections of scar and of opaque material from anterior chamber show no bacilli, nor anything like tubercular changes. Point of inoculation on neck cannot even be made out; the organs, carefully examined, present no abnormal appearance whatever.

Animal No. 3.—Inoculated same as others, March 7. April 22. No nodule can be felt on the neck. Left eye shows a small spot in centre of pupil of a yellowish color. Rabbit killed June 12th. All the organs healthy. No trace of the operation can be detected in the eye except a slight hernia of the cornea at point of puncture. In the neck no trace of the operation remained, but a slightly enlarged gland was found in the right axilla; sections of this showed merely hyperplastic growth, no tubercle tissue being made out. The material from anterior chamber stained after Koch and Erlich, and sections of the gland similarly treated, show no bacilli.

Animal No. 4.—March 7; inoculated same as the others. April 22; enlargement of neck can be felt, and extensive inflammatory changes seen in the eye; perforation of cornea with discharge of thick pus through the wound. Rabbit killed June 17. Point of puncture in neck could not be made out; no enlarged lymphatics; all the organs healthy; cornea is opaque, adherent to iris, and behind the eyeball is a large abscess, which on section discharges thin pus. Stained sections from the eye, pus from abscess behind the ball, and liquid from anterior chamber show no bacilli.

Thus, tubercular lesions more or less extensive, and containing tubercle bacilli, were produced in all four rabbits injected with bacillary sputum. Slight localized inflammatory lesions, containing no bacilli, were produced in two out of three animals, when the sputum of acute bronchitis in a healthy subject was used as an infecting agent.

Finally, in all the four rabbits injected with non-bacillary phthisical expectoration, slight, purely localized inflammatory changes resulted, in none of which tubercles or the characteristic bacilli could be detected. A significant hint in favor of the inflammatory nature of the slight lesions present is given in the fact that in the eye only, which is necessarily more susceptible to interference, were any changes caused by the introduction of the morbid material, while in the neck all trace of the operation had in all but one case disappeared.

It may be urged that possibly the patient from whom the sputum was obtained was not suffering from phthisical disease at all; if so, we must acknowledge our inability to diagnosticate the disease, for the case presented all the rational and physical signs of pulmonary tuberculosis, and until the sputum was examined nothing led to any suspicion that it differed in any way from the many others under observation. The bacillary and non-bacillary sputa employed are identical microscopically, save so far as the presence or absence of the specific bacilli is concerned, and the symptoms were almost entirely similar in every detail in both patients; yet in one case, the bacillary, general infection was at once caused in the animals injected, while in the other trifling localized lesions alone were induced. Such evidence must tend to strengthen the sinister claims of Koch's bacillus, and another failure recorded in an attempt to produce tuberculosis without its agency.

The results of this study may therefore be summed up as follows: (1) Non-bacillary phthisis is a comparatively rare disease. (2) Though clinically almost identical with bacillary phthisis, it differs from it in being non-infectious. (3) Non-bacillary phthisical sputum can be added to the list of agents which have been unsuccessful in producing tuberculosis. (4) All evidence so far tends to prove that the tubercle bacillus is necessary for the production of the disease artificially; and this study brings additional proof to the views expressed by Burdon Sanderson, and insisted on by Sternberg, that "whenever an inflammation becomes infectious, it owes that property to chemical changes in the exudative liquid of which the presence of microzymes is a necessary condition."

History of Case Selected for Experiment.—Mrs. M., æt. 45, housekeeper, has never been strong; can only remember her great-aunt as having died of phthisis; had no brothers or sisters; has never worked in dust specially, nor inhaled any irritating vapors; coughed in the winter of 1881–82, but her general health was fair until 1883, when she had increase of cough, fever and sweats began, and she steadily lost flesh and strength; for a year she had been almost constantly confined to the house. In December, 1884 (at the time of experiment), her condition is as follows:

Emaciated, debilitated, coughs constantly, and expectorates from two to three ounces during 24 hours of thick muco-purulent sputum, occasionally some blood; has anorexia, hectic in afternoon, night-sweats, and marked dyspnœa on exertion; pulse 90 to 120; respiration about 26 while at rest; temperature ranges from subnormal in the morning to 101° to 102½° F. in P.M. Two swollen glands can be seen in the neck. Physical examination: Marked depression under both clavicles, expansion only one inch; increase of vocal fremitus at apices, especially the left; under clavicle on this side faint broncho-cavernous respiration can be heard with coarse and fine rales; on right side in infra-scapular pleuritic rales without marked dulness, while at apex of same side there is entire absence of breath-sounds, with some fine crepitation.

Since the beginning of experiment patient has lost ground steadily.

Article IV.

The Choice of Methods in Abdominal Delivery. By Robert P. Harris, A.M., M.D., of Philadelphia.

The "old," or as it is sometimes erroneously called the "classic" Cæsarean operation, is very rarely performed at the present day, according to its original type. The abdominal and uterine incisions are usually made in the median line as of old, but after the fœtus has been removed, the whole character of the remaining process is changed. The abdominal cavity is now cleansed, and antiseptics are used in it and the uterus; and the same are employed in the external dressings. The uterine wound is rarely left to the closure effected by muscular contraction, but is now secured by sutures of different materials, and inserted after different methods, some of which are very ingenious. Drainage of the abdomen and uterus is by some thought imperative, and antiseptic irrigations of the abdominal cavity advisable by others, where puriform discharges are forming. Every imaginary scheme for preventing death by peritonitis and septicæmia is employed, and still the mortality is on the increase in the United States. Why is this? Because improved plans of dressing, antisepsis, drainage, and the uterine suture can never be made to overcome (what is evident in almost every case) the unfavorable prognostic condition in which the operator, who is rarely the original attendant, finds the woman, when at last the accoucheur, after vainly trying a variety of expedients, has become convinced that the knife can alone deliver his long-suffering patient.

The introduction of the uterine suture was certainly a valuable aid to the old method, in securing the wound against gaping, and allowing the escape of fluids into the abdominal cavity. It has, no doubt, enabled the operator to save patients *in extremis*, who must otherwise have been lost, but it cannot be made to work miracles in cases where the knife should have been used hours or days earlier. That it has become a popular improvement in our country is shown by its general introduction; and much greater expectations have been formed from it than have been realized in practice. Still the impression is that it has not had a fair opportunity to show what its true capabilities are in cases not rendered almost hopeless by delay and futile attempts at delivery. When will the accoucheurs of the United States realize the fact that the high rate of mortality lies at their door rather than at that of the operator?

Before 1867 the uterine suture had been used in our country but thrice, *i. e.*, in 1828, 1851, and 1852. In the next twenty operations after the advance of 1867, sutures were used in seven; in the succeeding twenty, in eight; and in the closing twenty-four, in eighteen: only in three cases out of the last nineteen were they not employed. There was certainly very little to encourage their use in the results of the cases in which they were used; but still the operators were convinced that the fault was not in the sutures, or their want of skill. We are sorry to draw such a picture as must be shown by the results of the last decade; but the truth is, that of the 38 Cæsarean operations performed in the United States since January 1, 1875, 29 were fatal to the women, and 21 to the children. Of 17 children delivered alive, one was premature and died in four hours, another had a fractured skull and lived one day, and two others survived respectively two days, and thirteen were diseased from their birth. Thus then we may say, that the operation saved in this period $23\frac{4}{19}$ per cent. of the women, and $33\frac{10}{19}$ per cent. of the children. Where more than three-fourths of the women, and nearly two-thirds of their children were lost, there must have been a great deal of bad management of the cases prior to the operation. As 21 children were dead before delivery, we have a very presumptive proof of want of skill in management. 28 of the women were in labor from one day to two weeks, of which 15 were in labor more than three days, and 7 of these again were 4 days and upwards. This record of delay explains our frightful retrogradation as compared with earlier reports.

We next come to the consideration of a more encouraging record of cases, mostly European, in which the chief element of success was a new method of suturing the uterine wound, devised by Dr. Sänger of Leipzig, in 1881, and more recently simplified by other operators. This method, although having very decided merit, cannot overcome the evil influence of delay, and the table I have prepared will show at a glance the importance of having the patient in a favorable condition for the operation at the time it is entered upon. It will be noticed that three of the cases occurred in this country, all fatal, and that but one child was saved, while one German operator, Dr. Leopold, saved 4 women and 5 children by 5 operations; the difference of result being very largely due to the difference of condition in the women at the time of the operation. Case 3, for instance, was admirably conducted by Dr. Garrigues of New York, and the woman had been but a few hours in labor; still he lost his patient, because of her condition produced by an ante-partum hemorrhage. Case 9 might have been regarded as almost hopeless at the time of the operation, from the effects of existing disease, long delay, and hemorrhage. It had been thought by the accoucheur to be one of extra-uterine pregnancy, with the fœtal head in the Douglas cul-de-sac. The operation established the fact that the peritoneal part of the uterine wound, when the serous surfaces are secured in contact, may unite as early as 26 hours after the operation. Case 5 belongs to a class which has been much the least fatal in Great Britain, after the old Cæsarean method, and should have escaped death, had her surroundings in hospital and her physical strength been more encouraging. This makes the seventh gastro-hysterotomy in our hospitals, all of which have proved fatal. In this case it will be noticed that the entire uterine wound had healed during the survival of 45 hours.

The method of Dr. Sänger is based upon the facts, that the serous surfaces of the peritoneum may be made to unite rapidly by a circumscribed adhesive peritonitis of a salutary character, if they are sutured in contact; and that welting this membrane into the uterine wound, by numerous superficial sutures, somewhat after the stomach and intestinal closure of Gély, will secure the wound against leakage and its resulting dangers. The full process of Sänger is quite complex, and it has been found in practice that both the dissecting up of the peritoneal coat, and cutting away a wedge-shaped slice of the muscular, were not absolutely essential to success. After the uterus contracts, its greatly diminished size so loosens its outer coat that it may be readily slid over the edge of the wound and turned in, as was done in Cases 3, 5, 9, and 12. Where the uterus is thickened and solidified by fibroid degeneration, as in Case 9, the membrane does not so readily slide, as where the uterine contraction is normal and more complete. The separation of the peritoneum by the knife makes a deeper welt, and the resection of the muscular coat one still deeper, but this loss of substance must weaken the ultimate cicatrix, and certainly can be avoided if the operation is performed in good season. In August, 1884, Dr. Leopold reported that his three patients were all living and in good health, and that the children were also well, the latter being then aged respectively 4 years and 3 months, 10 months, and 5 months. He stated at that time that he intended in future operations to avoid the resection and separation, as not essential to success. In Cases 11 and 12 will be noticed his more simple modifications and their results. Dr. Garrigues's and Dr. Jewett's cases proved under autopsy that entire union from peritoneum to mucosa could be effected without the separation or resection; the operation of Dr. Garrigues antedating all of Dr. Leopold's, except his first.

In Dr. Sänger's last monograph, which he was kind enough to send me, and to which I am indebted for the German cases in my table, are several designs for suturing the uterine wound, some of which are complex, but certainly very ingenious. I introduce here the two which have the most practical character, particularly the first, in which the deep and superficial sutures are tied separately. A third figure shows the superficial stitch used by Dr. Drysdale in his operation, the tightening of which draws the peritoneum into a welt, as seen in the lower illustration.

Fig. 1.

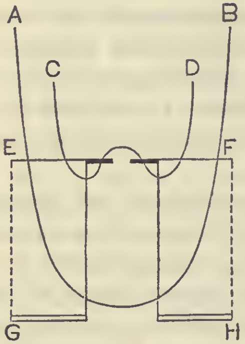

Fig. 2.

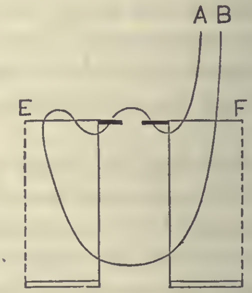

Fig. 1, A. B. represents the line of the deep-seated suture, which is carried down nearly to the mucous membrane; C. D. shows the direction of the superficial suture, the tightening of which will turn in the peritoneum, and draw the serous surfaces in contact.

Fig. 2 shows how the deep-seated suture of Fig. 1 may be made also to supply the place of the superficial one C. D. It is a much better plan to have two sutures, and let the greater strain come upon the deep-seated one. It is of advantage to have a large number, as there is less individual tension, and less danger of gaping.

Fig. 3.

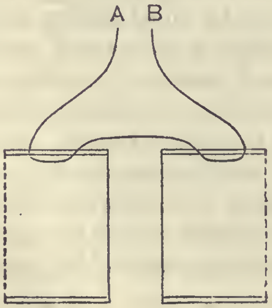

Fig. 4.

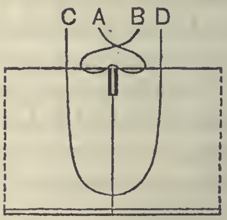

Fig. 3 shows a modification of the intestinal suture of Gély. When the superficial stitch is drawn upon, the peritoneal edges are to be turned in by the handle of a scalpel or other flat, blunt instrument. In cases where the serous coat is not loosely attached, it will be of advantage to dissect it up around the wound, as recommended and practiced by Sänger.

A third choice in the mode of abdominal delivery is that of Laparo-Elytrotomy, which it will be seen by my tabular record has been performed the same number of times, and with the same degree of success as regards the mothers, as Sänger's improved Cæsarean operation. It has this advantage, however, over all other methods, in the fact that the uterus is not cut open, which is an element of very great danger in gastro-hysterotomy, where the muscular activity of the organ has been long kept up. The abdominal surgery of the last decade has certainly established the fact that the opening of the peritoneal cavity is one of the least of the risks to be incurred. And I am satisfied from my own researches that long delay in operating vastly increases the risk of opening the uterus. The application of this method of Professor Thomas is limited, however; and in many of the cases in my record of 138 old Cæsarean operations of the United States, delivery under it would have been quite impracticable, the obstacle having been in the lower segment of the uterus itself. Where the risk in operating has been largely increased by delay and attempts at delivery, it becomes important that wounding of the uterus should be avoided, and as delay is the rule in our country in cases of impracticable pelvic delivery, Laparo-Elytrotomy deserves to be much more thoroughly tested than by a dozen examples in fifteen years. Like all of the methods here enumerated, promptness of action and avoidance of futile intermeddling add materially to the prospect of success. Where there is a putrid fœtus in utero, the choice will lie between uterine exsection after the plan of Porro and Müller, and Laparo-Elytrotomy as successfully performed by Dr. Walter R. Gillette, and shown in Case 8. It would appear to be safer, however, in such cases, to select the Müller operation and get rid of the risk of septic absorption, by the removal of the uterus and its offensive contents at once, as was done with success, after six days of labor, by Dr. Ramello, of Turin, in July, 1880. In Great Britain, where 75 per cent. of *early* Cæsarean operations have been fatal to the mothers, although quite a large proportion of the children have been saved, Laparo-Elytrotomy should be fairly and perseveringly tested in the same class of cases. If women are repeatedly lost, even when but a short time in labor, because of sequelæ traceable directly or indirectly to the uterine wound, then such subjects should be delivered by a method in which this highly sensitive organ is not incised. Cases 6 and 7 of the Laparo-Elytrotomy table were very unfortunately selected for this new form of delivery, and because they were fatal no one appears inclined to make another test in England.

TABLE I.—*Cæsarean Operations by the new*

No.	Date.	Operator.	Locality.	No. of pregnancies	Age	Conj. vera.	Cause of difficulty.	Condition of woman at time of operation.
1	May 25, 1880.	Dr. G. Leopold,	Leipzig,	2-para.	29	2⅜ in.	Generally contracted rachitic pelvis; sup. str't cordiform.	Favorable.
2	Sept. 11, 1882.	Dr. O. Beumer,	Greifswald,	6-para.	41	Nor'l.	Retro-cervical fibro-myoma.	Unfavorable; high fever.
3	Oct. 6, 1882.	Dr. H. J. Garrigues	New York,	Primipara.	30	$5\frac{3}{16}$	Lumbo-dorsal and pelvic kyphosis.	Pulse 124; exhausted by ant. part-hemorrhage
4	Oct. 4, 1883.	Dr. G. Leopold,	Dresden,	Primipara.	23	2⅜	Generally contracted flat rachitic pelvis.	Favorable; weak and anæmic.
5	Dec. 26, 1883.	Dr. Chas. Jewett,	Brooklyn,	11-para.	46	Nor'l.	Cancer of cervix uteri.	Pulse 94 to 108.
6	Mar 13, 1884.	Dr. G. Leopold,	Dresden,	2-para.	23	2⅜	Generally contracted pelvis.	Favorable.
7	July 17, 1884.	Dr. Oberg,	Hamburg,	Primipara.	37	2⅜	Contracted pelvis.	Favorable.
8	Sept. 29, 1884.	Dr. Ehrendorfer,	Vienna,	4-para.	29	Nor'l.	Abdominal fibroma.	Unfavorable.
9	Nov. 12, 1884.	Dr. T. M. Drysdale,	Philadelphia	Primipara.	37	Nor'l.	Immovable fibroid of posterior wall of cervix.	Very unfavorable; anæmic; pulse 124.
10	Nov. 16, 1884.	Dr. M. Sänger,	Leipzig,	Primipara.	21	2⅜–2½	Generally contracted and flattened rachitic pelvis.	Favorable.
11	Nov. 28, 1884.	Dr. G. Leopold,	Dresden,	2-para.	26	2⅜	Rachitic pelvis.	Unfavorable; pulse 120; feverish.
12	Dec. 5, 1884.	Dr. G. Leopold,	Dresden,	Primipara.	23	?	Great deformity of the pelvis.	Favorable.

Women saved 6, or 50 per cent. Children saved 10, or 83⅓ per cent.

Fatal results have repeatedly followed the Cæsarean operation in Great Britain, where the skill of the operator and the timeliness of the delivery would make us very hopeful if in this country. If then the fatality of the old operation in New York has been the inducing cause of a vital change in the process of delivery, with such a marked improvement in the results, *Sänger Method and its simplifications.*

No.	Manner of treating the uterine wound.	Time in labor.	Result to woman.	Result to child.	Cause of death in woman.	Remarks.
1	Serous coat separated; muscular coat resected, 8 deep silver and 12 superficial silk sutures inserted.	About 12 h'rs.	Recovered.	Living.	....	Child and mother alive in summer of 1884.
2	Same treatment as above; 7 deep sutures and 4 superficial of English fishing gut.	8 or 10 hours.	Died in 40 h'rs.	Living.	Double pyelonephritis.	
3	No resection of muscular coat; 12 deep and 12 superficial silk sutures, with peritoneum turned in.	6 h'rs.	Died in 50 h'rs.	Dead.	Shock and previous loss of blood.	Uterine wound found to have entirely united.
4	Treatment of wound as in cases 1 and 2; 7 deep silver and 14 deep and superficial silk sutures used.	8 h'rs.	Recovered.	Living.	....	Woman and child alive and well in summer of 1884.
5	No separation of peritoneal or resection of muscular coat; 20 deep and superficial sutures of sublimated silk, with peritoneum turned in.	9 h'rs.	Died in 45 h'rs.	Living.	Peritonitis; erysipelas appeared in the hospital.	Child lived about a year, was not well cared for; uterine wound healed through its entire thickness.
6	Same treatment as in cases 1 and 4; 5 deep silver and 15 deep and superficial silk sutures.	30 h'rs.	Recovered.	Living.	....	Both alive and well several months later.
7	Serous coat separated; muscular resected; 10 deep sutures of coarse and 17 superficial of finer silk inserted.	?	Recovered.	Twins; one living; one 13¾ in. dead.	....	Slight peritonitis; left phlegmasia dolens of leg; pleuritic effusion; finally reported perfectly well.
8	6 or 7 deep uterine sutures of silk, and between, a large number of superficial ones.	About 2 days.	Died on the 6th day.	Living.	Sanio-purulent peritonitis.	Uterine wound of fundus not united between the sutures; edges breaking down by sloughing.
	Peritoneum drawn over edges of uterine wound and secured by 11 deep and 11 superficial silk sutures.	2 w'ks.	Died in 26 h'rs.	Dead and putrid.	Septicæmia.	Peritoneum united; muscular coat gaping; uterine walls thickened by fibroid degeneration.
10	Serous coat separated; muscular resected; 8 deep silver and 20 superficial silk sutures used.	Some hours.	Recovered.	Living.		
11	Serous coat separated; muscular not resected; deep and superficial sutures of silk used, and the peritoneum turned in.	22 h'rs	Died on 6th day.	Living.	Septic peritonitis.	
12	Serous coat *not* separated, or muscular resected, as in his 1st, 2d, and 3d operations; 6 deep silver, 6 deep silk, and 10 superficial silk sutures, with serous surfaces brought in contact.	16 h'rs.	Recovered.	Living.	....	In the convalescence a fistula formed, through which in 5 mos. were removed 6 of the uterine wire sutures and 6 silk; the woman entirely recovered her health.

why may not the same be hoped for in London? In New York city and Brooklyn, 9 women and 9 children were lost under 11 Cæsarean operations, and in the balance of the State 7 women and 5 children under 8 operations; a loss in the whole State of $84\frac{4}{19}$ per cent. of the women, and $73\frac{13}{19}$ per cent. of the children, which is greater than the fatality in England.

TABLE II.—*Table of Laparo-*

No	Date.	Operator.	Locality.	Native of	Age	C. V.	Height.	Cause of difficulty.
1	March, 1870.	Prof. T. G. Thomas,	New York.	Ireland.	40	Nor'l.	......	Pneumonia for 10 days.
2	Mar. 22, 1874.	Prof. Alex. J. C. Skene,	Brooklyn.	U. States.	?	2¼	......	Rachitic pelvis.
3	Oct. 29, 1875.	Prof. Alex. J. C. Skene,	Brooklyn.	England.	31	2¾	......	Rachitic pelvis.
4	June 23, 1877.	Prof. Alex. J. C. Skene,	Brooklyn.	Bohemia.	37	1¼	......	Lordosis and double coxalgic anchylosis.
5	Dec. 3, 1877.	Prof. T. G. Thomas,	New York.	Ireland.	20	2¾	......	Coxalgic deformity of pelves.
6	July 14, 1878.	Dr. Thomas W. Hime,	Sheffield, E.	England.	37	Nor'l.	......	Cancer of recto-vag. septum.
7	Nov. 23, 1878.	Dr. Arthur W. Edis,	London, E.	Ireland.	20	2½	......	Small pelvis; anchylosis of right hip-joint.
8	Nov. 9, 1879.	Dr. Walter R. Gillette,	New York.	Scotland.	23	1⅛	4 ft. 4 in.	Deformed pelvis.
9	May 17, 1883.	Drs. Dandridge & Taylor	Cincinnati.	U. States.	32	Bis.soc. 2⅞	4 ft. 7 in.	Deformed pelvis.
10	Sept. 1, 1883.	Prof. Chas. Jewett,	Brooklyn.	Ireland.	40	Bis.soc. 2¾	......	Deformed pelvis.
11	Oct. 4, 1884.	Prof. Alex. J. C. Skene,	Brooklyn.	Scotland.	21	2	......	Rachitic pelvis.
12	Jan. 26, 1885.	Prof. Chas. Jewett,	Brooklyn.	U. States.	24	?	......	Lumbar lordosis and dorsal kyphosis.

Women saved 5, or 59 per cent. Children saved 7, or 58⅓ per cent.

Now mark the contrast: Laparo-Elytrotomy has been performed 9 times in New York and Brooklyn, saving 6 women and 5 children. Four of the six women saved were in labor, respectively, 8, 11, 16, and 22 hours, and the other two, 4 days and a week. Of the eleven Cæsarean patients, 6 were operated upon on the first day of labor, and but one was saved: the prognosis was "unfavorable" in ten of the eleven. In the Laparo-Elytrotomies, four were "favorable" and five "unfavorable" for the operation; all of the favorable cases recovered.

One other form of operation still presents itself for consideration. The Porro-Cæsarean section has its advocates in many lands, and has resulted very differently in different countries. It has been very successful in Austria, and quite the reverse in Germany. As a hospital expedient it stands unrivalled, having completely revolutionized the results in the Maternities of Milan and Vienna. Where the patient has been under treatment in hospital, and is operated upon early, the proportion saved has been very encouraging; but, like the old Cæsarean operation, success greatly depends upon the condition of the patient to be operated upon at the time when the section is commenced. If the woman is exhausted and

Elytrotomies, covering 15 *years.*

No.	Condition of woman.	Side of incision	Time in labor.	Result to woman.	Result to child.	Injury to bladder.	Remarks.
1	Moribund.	Right.	Not in labor.	Died.	Alive 1 hour.	No.	Operation in interest of child. Woman and child lived an hour.
2	Pulse 130, feeble.	Right.	48 h'rs.	Died.	Dead.	No.	Craniotomy attempted. Woman died of shock and exhaustion in seven hours.
3	Favorable	Right.	11 h'rs.	Recovered.	Lived.	Laceration.	
4	Unfavorable.	Right.	4 days.	Recovered.	Lived.	Laceration.	Child died for want of food and care.
5	Favorable.	Right.	16 h'rs.	Recovered.	Lived 18 days.	Laceration.	
6	Very unfavorable.	Left.	24 h'rs.	Died.	Lived.	No.	Woman a drunkard. 11 weeks in bed; died violently delirious in two hours.
7	Unfavorable, lower extremities œdematous.	Right.	17 h'rs.	Died.	Lived.	Laceration.	Woman died exhausted in 40 hours; no signs of peritonitis.
8	Unfavorable.	Right.	A week.	Recovered.	Dead and putrid.	No.	Forceps, version, perforation, cephalotribe, and cranioclast, all tried.
9	Unfavorable.	Left.	4 days.	Died.	Dead.	No.	Woman died in 44 hours. No evidences of peritonitis found on autopsy.
10	Unfavorable.	Right.	A week.	Died.	Dead.	No.	Woman died in 70 hours of septicæmia.
11	Favorable.	Right.	8 h'rs.	Recovered.	Lived.	Cut by scissors.	Scissor-wound, soon closed spontaneously.
12	Favorable.	Right.	22 h'rs.	Recovered.	Lived.	Laceration.	

feverish, the prognosis will be unfavorable, and still more so if the fœtus has died or been destroyed during the labor. It should always be remembered that the case of a dwarf specially requires an early attention. A careful examination of the valuable tables of Dr. Clement Godson will show the intimate connection that exists between the physical condition of the woman and the final result of her case.

ARTICLE V.

THE CAUSAL RELATION OF OBSTRUCTED CARDIAC CIRCULATION TO LYMPH STASIS. By SAMUEL C. BUSEY, M.D., of Washington, D. C.

In my former contributions to the medical press,[1] on the congenital and acquired forms of occlusion and dilatation of lymph channels, I collated a number of cases, previously published by different reporters, to illustrate the causes and special characteristics of these forms of disease.

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[1] New Orleans Med. and Surg. Jour.; and Congenital Occlusion and Dilatation of Lymph Channels. Wm. Wood & Co., 1878, New York.

In a few of the cases it was evident that the existent lymphangiectasis was attributable to interruption of the blood vascular currents either through the heart or lungs. I referred incidentally to those reports, but the illustrative cases have not, as far as is known to me, been collected and arranged in a manner to distinctly exhibit the relation of cause and effect subsisting between obstructed cardiac circulation and lymphangiectasia.

Before citing the cases relating to the direct proposition, it is necessary to refer to the predicate—that occlusion or stenosis of the thoracic duct, at or near its terminal extremity at the left subclavian vein, may, when the collateral circulation is not speedily and sufficiently established, produce dilatation or rupture of some part of the lymph vascular apparatus. This can be shown both by the results of experimentation and by post-mortem reports.

Morton[1] performed a number of experiments upon dogs by ligating the thoracic duct; in some the "receptaculum and in other the lacteals burst." In every case there was extravasation of chyle. In Sir Astley Cooper's[2] experiments, when rupture occurred it took place at the receptaculum; and Dupuytren's experiments upon horses were followed by nearly similar results. Cooper says it is not necessary to tie the duct. If the animal is fed with milk and the extremity of the duct is compressed one-half hour afterwards, the receptaculum will rupture. Those and similar experiments prove that, under certain conditions involving an interruption or complete arrest of the current of the fluid through the thoracic duct, the resultant distension and dilatation may prove sufficient to produce rupture, which may take place either in the receptaculum or in the lacteals. In those cases where rupture did not take place, the current of the fluid was re-established through anastomosing branches.

The clinical and post-mortem observations are even more conclusive. They connect directly the process of gradual occlusion of the duct by disease with the concurrent development of a diffuse area of lymphangiectasis, which in some cases terminated in rupture and extravasation.

Monro cites the case reported by Morton of "hydrops ascites lactea" in which the rupture of the lacteals was occasioned by the compression of the thoracic duct near the subclavian vein by large indurated tumors.

Morgagni[3] refers to the cases of Valsalva and Santorino, in both of which there was considerable dilatation of the lacteal vessels produced by the pressure of an aneurismal tumor on the thoracic duct. In Valsalva's case the aorta from the heart to the diaphragm was dilated, and "the lacteal vessels presented the appearance of numerous white spots having a diversity of figure and magnitude."

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[1] Donald Monro, Essay on Dropsy and its Different Species, pp. 22, 23.

[2] Medical Records and Researches, p. 100 *et seq.*

[3] 17 Epistle, De Sedibus et Causis Morborum, 1761, Lib. ii. p. 152.

In the body of a man who died after a large quantity of chylous liquor had been let out of his thorax, Bassius[1] discovered an orifice at or about the third dorsal vertebra from which the chylous material flowed as from a fountain. Below this orifice the thoracic duct was pervious.

Cayley[2] reports a case of obstructed thoracic duct and rupture of the receptaculum chyli. "On post-mortem examination some yellow fluid was found in the peritoneal cavity, and the peritoneum in front of the spine was bulged forward by the effusion behind it of a large quantity of milk-looking fluid. The receptaculum was much dilated, and on its anterior surface was a perforation two inches in length. The thoracic duct was immensely dilated throughout its course to its junction with the subclavian vein, where it suddenly became narrowed, and just at its mouth a fibrinous vegetation was attached to the lining membrane of the vein which completely occluded the opening of the duct. The narrowed part of the duct was blocked by a firm, yellow cylindrical coagulum."

Virchow[3] refers to the case he observed in a new-born calf, where in consequence of thrombosis of the external jugular vein the mouth of the thoracic duct was occluded, and nearly all the internal organs were dilated to the utmost with ectatic lymph-vessels filled with a slightly sanguinolent fluid. The intestines especially were covered with broad bead-like canals, arranged so closely together that the intervening tissue could scarcely be recognized.

Ormerod[4] reports a case of chylous ascites from which on several different occasions large quantities of a milky fluid were removed. This fluid Drs. Wilks and Marcet proved to be chyle, mixed, more or less, with common serous peritoneal effusion. On post-mortem examination "the left subclavian vein and its afferent vessels were found plugged with a light-colored, ragged clot, evidently of long standing. It was soft in the centre, and at one point was firmly adherent to the walls of the subclavian vein. In the abdomen and chest were also found numerous nodular masses consisting of an imperfectly fibrous structure."

Many other cases might be introduced in which dilatation of the thoracic duct, to a greater or less extent, was the result of partial or complete occlusion near its outlet, caused by the pressure of aneurismal or other tumors, or by disease of the coats of the duct; but such cases have rarely been associated with lymphangiectasia, other than cylindrical dilatation of the duct and enlargement of the receptaculum. In most of such cases the stenotic condition of the duct was compensated by the development of anastomosing branches through which the chyle and lymph channel connection with the venous system was preserved.

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[1] Observationum Decade Secundum, Observatio Septima.

[2] Trans. Path. Soc. Lond., vol. xvii. p. 163, 1866.

[3] Virchow, Archiv, vol. vii. p. 130.

[4] Trans. Path. Soc. Lond., vol. xix. p. 199, 1868.

The preceding citations of the experimental and clinical data establish, inferentially if not conclusively, the preliminary proposition, that retardation or arrest of the current of the fluid in the thoracic duct at or near its outlet into the subclavian vein may produce dilatation, distension, and rupture of lymphatic vessels, and consequent effusion of chyle and lymph into the serous cavities. The remoteness of the effects from the obstacle interrupting the current of the fluid may depend upon various concomitant conditions, especially upon the anatomical integrity and the tensibility of the vascular walls. When the impediment to the flow of chyle and lymph occurs at or near its outlet the area of stasis and ectasis would necessarily depend upon the duration and extent of such obstacle; and, hence, when the area of ectasia is extensive the manifest inference is that the cause has been one of gradual development and protracted duration. In the case of Bassius, dilatation and rupture were caused by impermeability of the distal extremity of the duct; in Morton's case the rupture of the lacteals was occasioned by the pressure of a tumor upon the duct near the subclavian vein. In Ormerod's case of chylous ascites the interruption to the flow of the chyle was caused by the "plugging of the left subclavian vein and its affluent branches with a light-colored, ragged clot, evidently of long standing." The resistance to the flow of the contents of the thoracic duct must have been derived exclusively from the interrupted venous blood current. The heart was normal and the duct was unobstructed. In Cayley's case of obstructed thoracic duct and rupture of the receptaculum, two factors were in operation, interrupted blood-current, occasioned by the fibrinous vegetations attached to the intima of the subclavian vein, and the partial obliteration of the lumen of the duct near its terminus. In Virchow's case of the new-born calf, the condition existing partially exemplifies the obstructing forces operating in the cases of Ormerod and Cayley. The mouth of the duct was occluded by a thrombosis of the external jugular. In addition to the slowing of the venous blood-current in the jugular and in the subclavian, produced by the projecting part of the thrombus, the exit of the fluid from the duct was also impeded. The occlusion of the mouth of the duct was probably inconstant and incomplete during life, nevertheless the area of lymphangiectasis was extensive, involving nearly all the internal organs.

The force exerted upon the contents of the thoracic duct by the passing current of the blood in the subclavian vein is nothing more than an illustration of the hydraulic principle of Venturi; that is, if a stream of water is made to flow through a tube, into which another opens and communicates at its distal end with a reservoir of water, a current will be established in the second tube and continue as long as the stream flows through the first tube, or any fluid remains in the reservoir of the second. The anatomical junction of the thoracic duct with the venous system is peculiarly favorable to the maximum development of this principle, for the near affluence of the internal jugular, and the downward inclination of the duct to the subclavian, contribute to the enhancement of the effect upon the current of chyle. Out of this principle of Venturi must grow the converse, that any retardation of, or obstacle to, the current of blood in the subclavian vein, either from diminution of its lumen or from regurgitant heart affections, must slow the movement of the chyle in the duct and in its tributaries.

The influence of partial obliteration or stenosis of the thoracic duct at or near its termination in the causation of dilatation or rupture of some part of the lymph vascular system cannot be doubted. The evidences of experimentation must be accepted as conclusive. The effects of stenosis produced by the gradual encroachment from disease of the duct or of surrounding and contiguous tissues and structures have been shown by the clinical and *post-mortem* citations. In this latter class of cases the ectasia is gradual in its development and more extensive in its field. In those cases where the lymphangiectasis was consequent upon the slowing or interruption of the venous blood-current in the left subclavian vein, the relation of cause and effect seems equally well established. It remains now to show that such diseases of the heart as slow, impede, or stagnate the venous blood-current in the left subclavian or innominate vein, may also produce lymph-stasis. Petters[1] reports a case of lymphangiectasis in which were found upon the visceral peritoneum "numerous cysts from the size of peas to that of filberts, some colored bright, and containing serum. Upon the small intestines numerous lenticular protuberances, transparent, and filled with wine-yellow fluid. . . The glands of the right inguinal region were transformed into cysts of small walnut size, filled with wine-yellow fluid. From the inner wall of these cysts extended dilated lymph-vessels of crow-quill size, which connected the cysts with each other, so that a dilated vas efferens and afferens could be seen in each cyst. Upon puncture a yellowish fluid spouted from these cysts in a jet of several inches. The lymph-vessels and cysts formed a mass which it was difficult to unravel. The lymph-vessels in the vicinity and the thoracic duct were greatly dilated.

"The heart occupied the entire anterior thoracic cavity. The enormous enlargement of the heart included the entire right side of the organ, so that the left ventricle with the auricle formed only an appendix. The muscular tissue of the left ventricle, which would not contain a hen's egg, was thin and flaccid. The left venous orifice, by the growing together of the apices of the bicuspid valves, was changed into a small crescentic opening, barely admitting the point of the little finger. The latter was callous and inclosing here and there a bony plate. Right ventricle largely dilated, with thinned walls. Columnæ carneæ of both ventricles very slender and tendinous. Right auricle as large as a child's head, its walls here and there formed of a thin layer of pericardium. Apertures of coronary vein gaping finger wide. Aortic valve competent. Right venous orifice contracted."

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[1] Vierteljahrschrift für die Practische Heilkunde, vol. xiv. p. 141, 1861.

This autopsy discloses a stenosis of the left venous orifice, and a moderate contraction of the right ventricular opening. Petters concluded that the stasis of lymph, followed by great dilatation of the lymph-vessels and glands, was caused by the organic disease of the heart. It cannot be doubted that the interruption of the current of blood by the narrowing of the orifices and dilatation of the right side of the heart retarded the movement of the column of fluid in the lymph-vessels. This influence, first demonstrating itself upon the movement of the contents of the thoracic duct, causing distension and dilatation of the trunkal vessels, was transmitted backward, or rather produced stasis of lymph in remote vessels. The lenticular eminences, filled with a transparent fluid, grouped together on the mucous surface of the small intestines, were, probably, ampullar dilatations of terminal lymph-spaces, and the bodies described as cysts on the peritoneum were of like histological nature. Concerning the nature of the gland implication there can be no doubt. The case exemplifies the three varieties of lymphatic telangiectasis made by Lebert, in its lenticular eminences, cyst-like bodies, and transformed glands.

At the conclusion of this report, Petters refers to the case of an old female "suffering with stenosis of the left venous orifices of the heart," upon whose right arm he found several semi-solid tumors, situated immediately under a fatless cutis, which he regarded as dilated lymph-glands.

T. Granger Stewart[1] reports a case of "dilatation of the lacteals," associated with an hypertrophied and fatty heart, with diseased aortic valves and dilated auriculo-ventricular orifices. In this case the stasis of chyle occurred in the intestinal villi, producing dilatation of the central lacteal vessels of the villi, and arresting the further absorption of the chyle. To the incompetency of the aortic and auriculo-ventricular valves was added fatty degeneration of the heart. Here enfeebled action of the organ and regurgitation were co-operating factors in slowing the movement of the chyle.

In Rokitansky's[2] case of chylous ascites, there was dilatation of the heart, "with thickening and shortening of the mitral valves." The cardiac affection not only interrupted the flow of chyle in the thoracic duct, but caused a stasis of chyle in the lacteals and mesenteric glands; of lymph in the subpleural lymphatics; and an effusion of a milk-like fluid into the pleural and peritoneal cavities.

In Hughes's[3] case of abdominal effusion of a chylous fluid, supposed t have resulted from the pressure of mesenteric tumors, "the heart was thin, pale, weak, and flabby," and numerous "lacteals—large, tortuous, varicose, and distended, some with milk and others with a clear fluid"—were observed in all parts of the mesentery. The case was complicated with abdominal tumors, "consisting of several agglomerated mesenteric glands," believed to have been cancerous; but from a number of the enlarged glands "a cream-like fluid exuded," and hence it is not improbable that the morbid condition of the glands and lacteals was due to stasis of chyle and lymph, caused by the disease of the heart.

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[1] Edinburgh Med. Journ., vol. ix. p. 448, 1863.

[2] Path. Anat., Bd. ii. s. 388; also Ziemssen's Cylco., vol. vi. p. 531.

[3] Guy's Hospital Reports, vol. vi. p. 297, 1841.

In this connection the case of mitral and tricuspid insufficiency, with granular liver, ascites, anasarca, and thrombosis, reported by Oppolzer,[1] is interesting. The inferior and superior venæ cavæ were occupied at their outlets with pale, yellow, soft coagula. From the superior, the clot extended with a jagged end into the auricle, and continued into the right subclavian, as well as into the right internal jugular as far as the foramen lacerum. The left innominate and the terminus of the left subclavian were obliterated. The thoracic duct was plugged at its termination by a pale-red, fibrous coagulum. Its walls were thickened, and its lumen, from the receptaculum to the occluding thrombus, was greatly dilated. The regurgitation of blood into the thoracic duct was caused by the obstruction to its entrance into the heart.

There is another class of cases of lymphangiectasis associated with symptoms of cardiac disease, but the direct connection of the lymph-stasis with an affection of the heart was not proven by a *post-mortem* examination. The following, reported by Cholmeley,[2] is an example of this class:—

This was a case of great enlargement of the right lower extremity, with an intermitting flow of a milky fluid from behind the ankle. The lymphatic engorgement began at the age of three years, and continuously increased during the succeeding six years, when it had involved the whole leg up to the groin. "The pulse was normal as to frequency and rhythm, and of fair volume and force; but all over the heart there was a soft, blowing, systolic murmur, which was loudest at the junction of the second left costal cartilage with the sternum."

The child was "short, stout, and generally healthy-looking, with a good bright-red color in the cheeks and lips, but was easily affected by cold, and then complained of a want of breath and a feeling of tightness in the chest; and at such times the complexion assumed a markedly livid tint; respiration became somewhat labored and noisy, the extremities cold, and the nails dark-blue."

The clinical history does not, in the absence of a *post-mortem* examination, positively establish any connection between the lymph-stasis which first appeared near the ankle, and the disturbed cardiac circulation; but such an hypothesis cannot be excluded. The remoteness and limitation of the area of lymphatic engorgement cannot be accepted as negative conditions disproving it. Retardation of the venous current near the heart, and consequent repletion and distension of the thoracic duct and receptaculum, would assuredly offer resistance to the movement of the lymph in affluent vessels. The assumption that the engorgement could have been due to devastated inguinal glands, or occluded lymph-vessels in the abdominal cavity, is discredited by the appearance of the intumescence first about the ankle, and its gradual and continuous extension upward; whereas, if either of those conditions had existed, the lymph-stasis would have begun at the locality of such obstruction and extended in the reverse direction. Lymphatic engorgement does not follow the law of symmetry, and its limitation to one lower extremity may be ascribed to any one or more of the variety of circumstances, such as the varying tensibility, location, distribution, or the anastomosing connections of the lymph vascular system of the lower extremities.

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[1] Allgemeine Wiener Medicinisch. Zeitung, p. 149, 1861.

[2] Trans. Clin. Soc. Lond., vol. ii. p. 116, 1869.

The explanation of this relation of cause and effect between cardiac disturbances and lymph-stasis must, in a general way, be sought in the varying conditions of blood-pressure. A potential, if not the predominant factor concerned in the locomotion of the lymph is the difference between the arterial and venous blood-pressure; the greater this difference the more rapid the movement of the lymph. In a normal condition of the heart, venous orifices, and great afferent and efferent vessels, the blood-pressure in the innominate veins and their affluent branches, during diastole, is at its minimum—represented in comparison with the pressure at the aortic summit, as *nil*; so that, whatever may be the potentiality of the difference between the arterial and venous blood-pressure as a force in promoting the locomotion of the chyle and lymph, it is at its maximum when the venous blood-current is flowing most easily and rapidly into the right auricle. Therefore, it must follow that any disease of the heart, or any condition of its affluent veins which retards, impedes, or obstructs the free and rapid flow of the venous blood into the right auricle and through the tricuspid orifice, will slacken, interrupt, and obstruct the movement of the chyle and lymph in the thoracic duct and its tributary vessels. This conclusion is not derived merely through inductive reasoning, but is illustrated and verified by clinical observation and post-mortem appearances.

The chief function (Küss) of the right auricle is to facilitate the flow of the venous blood by allowing itself to be filled, thereby lessening the blood-pressure in the affluent veins. During its contraction reflux is prevented by the fulness of the veins and by the elasticity of the ventricular walls. If these functions are disturbed and changed by disease of the walls of these cavities, reflux may take place, with increased blood-pressure in the affluent veins, lessening of difference between the arterial and venous blood-pressure, and consequent slowing of the lymphatic current.

If, as claimed by some, the circulation of the lymph is due mainly to transudation and endosmosis taking place at the periphery, increased pressure in the venous system would be equally, if not more effective in the causation of disturbances of the intermediate plasmatic circulation. The inquiry is not, however, into the causes of lymph-stasis and ectasis, but relates to the influence of cardiac disease in the production of these affections of the lymphatic system.

In conclusion I append the following quotations :—

"Obstructive engorgement of the great veins extends also to the thoracic duct. When the subclavian vein is filled to distension, the flow of chyle and lymph must encounter a resistance equal to that opposed to the current of any other vessel which empties into the subclavian. Nay, if lymph be the source of the fibrin in the blood, we see, upon simple physical grounds, why the blood of emphysematous patients is poor in fibrin, why the venous crasis presents hyperinosis and increase of fibrin. Restricted afflux of chyle must, moreover, prejudice nutrition both of the blood and of the entire organism. It is one of several causes which contribute to the general emaciation and to the premature marasmus of emphysematous persons; perhaps, too, it may account for the lack of albumen in the serum of the blood, which produces a tendency to the establishment of dropsical symptoms."[1]

"The inadequate emptying of the thoracic duct into the left subclavian vein, over-distended with blood, will, in cases of pulmonary emphysema, lead to impoverishment of the blood in so far as concerns such elements as are derived from the lymph, the colorless blood-corpuscles, fibrin, and albumen."[2]

ARTICLE VI.

ON THE USE OF STRYCHNIA IN NERVOUS DISEASE. By LANDON CARTER GRAY, M.D., of Brooklyn, New York.

IN 1880 Dr. J. S. Jewell,[3] in the course of a debate upon a case that had been narrated by Dr. S. G. Webber, advocated the use of large doses of strychnia, in some cases as much as one-tenth of a grain, in cases of myelitis, commencing as soon as the febrile symptoms had subsided. At the time it seemed to me that the proof was lacking to show the relationship between the improvement and the drug. In a myelitis of the anterior horns (poliomyelitis anterior) or a progressive muscular atrophy the progress of the disease can be foreseen with considerable accuracy, although in the former malady it is not always easy to do this during the first week or even during the first month in some few very subacute cases; and the prognosis is still more assured in that myelitis of the columns of Burdach which we call locomotor ataxia, or in that other affection of the lateral pyramidal column known as lateral sclerosis. Outside of these forms, however, our differentiation of disease lacks precision. The embryological researches of Flechsig, the physiological experiments of Woroschiloff and others, and the fragmentary pathological observations of many, have mapped out other columns in the spinal cord that are probably distinct in their functions, and, therefore, probably distinct in their diseases. There are, for example, the anterior pyramidal columns, the anterior fundamental columns, the lateral columns *proper*, the direct cerebellar columns, the columns of Goll, each of which, according to the pathological knowledge that we have already obtained of the other strands just named, are probably subject to individual disease. Our neurological nomenclature indicates our pathological ignorance in this respect. Any myelitis that is not of the anterior horn, or of the column of Burdach, or of the lateral pyramidal column, is called, in general terms, simply a myelitis; and yet two succeeding cases may be as anatomically distinct as is disease of the anterior horn from disease of the column of Burdach—or, to use simpler and better known terms, as is an essential infantile paralysis from a locomotor ataxia.

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[1] Niemeyer, Text-Book of Practical Medicine, vol. i. p. 120.

[2] Hertz, Ziemssen's Cyclop., vol. v. p. 382.

[3] Journ. Nerv. and Ment. Dis., July, 1879.

These distinctions, it seemed to me at the time of the discussion, and it seems to me still, Dr. Jewell overlooked. But further conversation with Dr. Jewell in after years, and his persistent and earnest belief in the correctness of his views, arrested my attention, so that for several years I have endeavored to verify his observations. I have prescribed strychnia accordingly in many cases of myelitis. In the really acute cases, however, when the onset of the symptoms has been sudden and grave, I have only made some two trials. In these the drug was so badly borne, quickly producing distinct dyspnœa or some exaltation of muscular reflex action which I feared to prolong, that I did not feel warranted in continuing what must be still regarded as an untried method of treatment.

Except in these grave acute cases, febrile symptoms are so much the exception that the rule as to waiting for the subsidence of them will not hold. When the symptoms are subacute, reaching their acme in five to ten days, fever is lacking, unless the patient be a child. In two cases, for example, of myelitis of the anterior horns, I had begun the administration of the drug in doses of $\frac{1}{50}$ to $\frac{1}{40}$ grain, three times daily, but in one the supervention of a distressing dyspnœa, in the other a quickly ensuing cephalalgia and feeling of fulness about the head, made me abandon it. These cases, given in more detail, were as follows:—

CASE I.—C. G., aged 45, robust, vigorous business man, who had been at the head of a large and harassing business for several years. A hard worker, and had for several months past felt himself overworked. Subacute onset of disease. Weary feeling one day in the legs, next day tingling, numb feeling in the fingers and increase of weariness in the legs; on third day legs failed him so that he walked with effort. On third day I saw him. He had distinct motor weakness of lower and upper extremities, slight impairment in the perception of tactile and painful impressions, and slight impairment of response in extremities to faradic and galvanic stimulus, but the polar reactions were not altered. I may say that the electrical alterations were so slight that I had a doubt as to whether they were not within physiological limits. Tendon reflex *nil.* The bladder and the rectum were not affected. *Diagnosis of Poliomyelitis Anterior.* —I immediately put the patient to bed, kept him there for ten days, put him on his feet gradually, administered the iodide of potash, ergot, galvanism, etc., and he made an excellent recovery in some five weeks. It was about the fifth day that I first administered the strychnia, and again about the third week. Each time it produced the same unpleasant dyspnœa.

CASE II.—J. L., 38, a comparatively young man, of excellent health, excellent habits, except that he smoked to excess, who was retiring from business with a competence after twenty years of hard work; he had not, however, felt himself overworked. The onset of the symptoms extended over some six days, at the end of which time he walked with effort, and complained of slight subjective disæsthesiæ in upper and lower extremities. Slight diminution in response of nerves to faradism and galvanism. No polar changes. Sensations of touch and pain very slightly impaired, distinct motor weakness of lower extremities, no electrical alterations. Bladder and rectum unaffected. No tendon reflex. Diagnosis of poliomyelitis anterior. Patient made a good recovery in the course of a month. Strychnia administered about fourteenth day.

CASE III.—In the case of a girl, aged 18, in whom there suddenly supervened a myelitis, affecting the cord from the lumbar enlargement to the cervical enlargement, with early implication of the lateral pyramidal columns. The administration of strychnia, gr. $\frac{1}{60}$, was begun about six months after the onset of the disease. This was on December 20; on the 30th the dose was increased to $\frac{1}{40}$; on January 2, to $\frac{1}{30}$; on the 7th, to $\frac{1}{25}$. On the 11th, after taking the morning dose, there suddenly ensued a violent attack of muscular spasm, affecting the trunk and extremities, so that patient became seriously cyanosed. The attack lasted about an hour, and passed off under the administration of ether by inhalation; but for several days afterward any distinct sound or noise caused spasm.

In some more chronic forms of myelitis, however, I met with more success.

CASE IV.—G. B., 40, butcher. Patient was on board the steamboat "Seawanhaka," that took fire in the Long Island Sound several years ago, and burnt to the water's edge, with a frightful loss of life. Jumping into the water at the cry of "fire," he was struck by the paddle-wheel and rendered unconscious, but was saved. On regaining his consciousness, he found that his lower extremities were paralyzed. Some five years after this he came to St. Mary's Hospital, August 15, 1885. Unable to stand; great motor weakness of lower extremities and paresis of upper; muscles atrophied; marked impairment of faradic response, also of galvanic, and the negative opening contraction obtained with a much weaker current than should be the case; partial paralysis of rectum; tactile and painful sensations much delayed and impaired; no tendon reflexes; never had any cincture feelings; slight cephalalgia and amblyopia. General health greatly impaired; has lost some twenty pounds in weight; is anæmic; suffers much from insomnia. Ergot ext. fld. ʒj ter in die ordered; also, galvanism.

Aug. 26. No improvement.

Sept. 1. Vesical paralysis has slightly increased. Belladonna ordered; ergot discontinued.

10*th.* Increase of rectal weakness, so that he cannot retain feces.

21*st.* No better.

Oct. 17.—No improvement. Strychniæ sulph. gr. $\frac{1}{50}$ ordered three times daily, which was gradually increased to gr. $\frac{1}{40}$ by the 25th.

Nov. 6.—Doing well; can walk about the ward with the aid of a cane in each hand. On the 18th dose increased to gr. $\frac{1}{30}$. 25th, has so improved that he uses only one cane.

Dec. 12.—Walks without any cane, but with great caution.

This improvement continued until he could walk so that only a slight lingering in his gait was noticeable; bladder and rectal trouble almost disappearing. Thinks himself well. On Feb. 9th of this year he was discharged thus benefited, at his own request, since which time I have not heard from him.

Case V.—K. D., aged 30. Onset shortly after a miscarriage, extending over several weeks, eventuating in complete motor and sensory paralysis of upper and lower extremities, trunk and neck muscles, urinary incontinence, and paresis of sphincter ani. Reaction of degeneration. Tendon-reflex *nil.* She was admitted to St. Mary's Hospital Sept. 4, 1885, having been totally paralyzed some three weeks before admission. Until Oct. 5, *i. e.*, 31 days, she was treated by ergot, ʒiss doses of the fluid extract (Squibb) ter in die, but the symptoms remained stationary. At this date the use of strychnia was begun, in gr. $\frac{1}{40}$ doses, increased by the 28th to gr. $\frac{1}{35}$. Improvement at the latter date was marked, patient being able to move leg slightly, whilst hitherto she had scarcely moved the toes.

Nov. 15.—Dose increased to gr. $\frac{1}{30}$; Dec. 15, to gr. $\frac{1}{20}$, during which lapse of time patient steadily improved until Jan. 10. She was able to get out of bed and sit in a chair. Shortly afterward there were slight symptoms of strychnia poisoning, and the dosage was temporarily reduced to gr. $\frac{1}{30}$. Beyond this point she did not make any essential improvement. Slight feeble movements of the hands and feet, moderate finger and toe movements, sufficient return of strength in the neck and trunk muscles to hold the head and body erect in a chair, not able to walk, this was the uttermost that was reached. After a month's further trial of the strychnia, therefore, it was discontinued, since which time the patient has remained in an almost stationary condition.

In five cases of progressive muscular atrophy I have given strychnia in doses up to gr. $\frac{1}{25}$. In all of them it acted as a remarkable stimulant, inducing such a sense of well-being that most of them have greatly felt the need of it when it was discontinued, so that several take it continuously. In one very marked and typical case $\frac{1}{30}$ to $\frac{1}{25}$ of a grain has been taken daily three times for nearly two years. In none, however, was there any real improvement. Dr. S. Weir Mitchell, in his work on the treatment of neurasthenia by rest and forced feeding, recommends strychnia in doses of gr. $\frac{1}{30}$ at the time when patients are to be taken out of bed. I have pursued this plan in a number of such cases, and have satisfied myself that it is invaluable. But, singular to say, three cases of neurasthenia, which were treated in the general way, bore strychnia in gr. $\frac{1}{30}$ doses badly, severe toxic symptoms being induced in two.

I have, however, never felt myself warranted in giving such doses as Dr. Jewell has given. I have never felt it safe to exceed gr. $\frac{1}{20}$. Indeed, even when giving $\frac{1}{50}$ or $\frac{1}{40}$ of grain, I have always been on my guard, because I have on several occasions found the action of the medicine to be cumulative. It was notably so in the case of transverse myelitis with contracture. Nor have I ever been able to dispossess myself of scepticism as to the benefit to be obtained from a toxic dose, which may possibly vary in amount with each individual and each disease; and I have therefore refrained from increasing the dose beyond the first toxic symptoms.

These cases are too few in number, of course, to warrant any conclusions. As far as they go, they demonstrate that strychnia was not well borne by two cases of severe acute myelitis, or by two subacute cases of mild poliomyelitis anterior; that gr. $\frac{1}{25}$, continued for four days in a case of transverse myelitis with early extension to the lateral columns, given three months after onset, suddenly induced alarming toxic symptoms; that one chronic case of general myelitis of traumatic origin was greatly benefited, as was also a case of general myelitis in which the onset had been gradual; that in five cases of progressive muscular atrophy it acted as a remarkable stimulant; that, as Dr. Weir Mitchell has indicated, it was decidedly beneficial in cases of neurasthenia, which, after being treated by some eight to ten weeks of rest and forced feeding, were taken out of bed, although it failed to agree with three cases of neurasthenia treated in the ordinary way. For these reasons I intend this paper merely as a memorandum upon the subject, which I certainly think is worthy of further attention.

In conclusion, I desire to say that I have been at some pains to examine the physiologically experimental knowledge which we have of this drug, and I have been unable to obtain therefrom any indications as to its employment in this particular therapeutic direction.

ARTICLE VII.

THE PREDISPOSING CAUSES OF ANEURISM. A STATISTICAL INQUIRY.

By JOHN B. HAMILTON, M.D., Supervising Surgeon-General of the U. S. Marine Hospital Service, Prof. of Surgery in University of Georgetown, D. C.

I HAD been of opinion for some years that diseases of the heart and circulatory organs in seamen have, for their greatest predisposing cause, the combined effect of heat and moisture while engaged in exhausting occupation, together it might be with rapid diurnal change of temperature. To establish, if possible, the fact, I commenced the inquiry, the result of which not only modified that opinion, but seemed to overthrow many others strenuously urged by writers upon the subject. If, in the remarks which follow, it is noticed that positive deductions proving the real causes of the disease are wanting, it does not prove that they are valueless, for the upsetting of a false doctrine is only less valuable than the establishment of a truth.

When one turns to the text-books the great discrepancy of opinion therein is itself evidence that the truth, if known, has not made any great headway. Thus Chelius: "Aneurisms arise either of their own accord or after determinate external influence." He mentions rheumatism, gout, scrofula, syphilis, mercury, and chronic alcoholism as "internal causes," and "wounds, violent efforts in lifting weights, in jumping, coughing, and the like," as "external causes." Richerand stated that he observed that the attendants of the surgical amphitheatre were peculiarly liable to aneurism, and he attributed it to the potations of alcohol which they drank, together with the exertion of carrying in the bodies to the amphitheatre. Guthrie gives muscular exertion as the greatest predisposing cause. Erichsen gives age, climate, and cachexia, and under the head of climate repeats the statement of the older writers that the disease is "far more frequent in cold than in hot countries." But in his judgment the habits of the people regulate its prevalence. In regard to cachexia, while mentioning the general opinion that syphilis predisposes to the disease, he does not think that there are statistics to warrant the conclusion. Phthisis, he asserts, is antagonistic to aneurism.

Sir George Ballingall states, in regard to syphilis as a causative agent, and as to the occupation of the soldier:—

> "I may here mention a singular opinion of Baron Larrey as to the cause of some aneurisms, which he distinctly ascribes to a syphilitic virus giving rise to ulceration of the internal coat of the artery; and he narrates some cases in which the exhibition of mercury is said to have been followed by a diminution of the dilatation of the artery. Larrey's observations coincide with those of Scarpa and Sabbatier as to the formation and increase of the tumor, and his experience, I find, coincides with my own as to the infrequency of aneurism in what may be termed its spontaneous or idiopathic form amongst soldiers." (*Outlines of Military Surgery*, Edinburgh, 1852.)

Mr. Holmes, in his System of Surgery, thinks the assertion that syphilis and mercury predispose to aneurism is gratuitous. Alcoholism, he thinks, is an important factor, but he avoids the main issue by stating that in "general terms" . . . "anything may be a cause of aneurism which destroys the balance that ought to exist between the expansive force of the circulation and the reaction of the wall of the artery, so as to make the former preponderate." He, however, in *Quain's Dictionary*, states that it is very probable that chronic alcoholism has an influence in the causation of aneurism.

Prof. S. D. Gross says—

> "Of the causes which induce spontaneous aneurism more frequently in one artery than in another, nothing definite is ascertained. Several circumstances, however, may be assigned as affording at least a plausible explanation. How far any one of these causes alone is capable of producing aneurism is altogether a matter of conjecture."

He observed its frequency in the southwestern region of the United States. He recognized the great prevalence of the disease among sailors, but thinks soldiers less frequently affected than common report gives credence for. Mercury and syphilis, "and the inordinate use of spirits are supposed to predispose to the formation of aneurism, but how far, or in what degree, remains to be demonstrated."—(*System of Surgery*, 6th edition, vol. i. p. 690 *et seq.*)

Prof. D. Hayes Agnew (*Princ. and Prac. Surgery*, vol. i. p. 545) does not

> "believe that occupation—that is, the ordinary employment performed by the working population—can be placed among the predisposing causes of aneurism. There is nothing in honest labor to produce arterial degeneration. . . . The doctrine that constitutional syphilis is a fruitful source of aneurism, and especially the intra-thoracic form of the disease, has for some time been gaining strength, and may be said at present to be deeply rooted in the medical mind. Our knowledge of the relation between syphilitic poison and arterial degeneration is entirely too meagre to warrant any hasty generalizations on this point. . . . If aneurism is so commonly the sequence of a syphilitic diathesis, how shall we explain the infrequency of the former disease in females, who furnish so many examples of the latter affection? During an experience of twelve years in the Philadelphia Hospital, an institution which is exceptionally rich in syphilitic disease, I never witnessed a single case of aneurism among the inmates of the venereal department."

Billroth states that, although atheroma is "a very frequent disease of old age, and occurs everywhere, aneurism is by no means confined to old persons. In Zurich, where atheroma is common, aneurism of the extremities is rare." He mentions the curious distribution of the disease over Europe, and says that—

> "Special causes are little known; popliteal aneurism is most frequent among aneurisms of the extremities; the explanation has been sought in the superficial position of the popliteal artery, in the tension to which it is subjected on sudden movements, contusions, etc. Thus this form is said to occur especially often in England, in footmen who stand behind the carriages, but I must acknowledge that to me this seems improbable as the explanation given for chambermaid's knee. I am inclined to believe that the tendency to diseases of the artery, as to gout, is due to hereditary influence."

Dr. Myers thinks the prevalence of aneurism among British soldiers is primarily due to tight clothing. (London *Lancet*, Feb. 20, 1869.) Surgeon Major Robinson (*Ibid.* March 30, 1869) is of opinion that the stock and collar of the soldier have a great deal to do with it. Surgeon Henry Muscroft, while agreeing with both the foregoing surgeons that aneurism is more prevalent in the British army than in civil life, urges against Dr. Myers' statement that tight clothing is an important factor in its causation, that females, notably exempt, wore tight corsets continually; and Staff Surgeon Gore states (*Ibid.* p. 625, May, 1869) that aneurism is as prevalent at Honduras as at Good Hope, and that the West India regiments wear no collar and very loose clothing, owing to the climate, and the mortality from aneurism is 2.24. This point seems to have been overlooked by Mr. Barwell (*International Encyclopædia of Surgery*, vol. iii. p. 379), who thinks that Mr. Myers has conclusively proven that the prevalence of aneurism in the British army is "due to over-tight uniforms, especially the stock." Mr. Barwell, like many other recent writers, takes issue with Aitken and those claiming syphilis to be an especial factor in the production of aneurism, and says the burden of proof, which must rest on the affirmative, is entirely wanting. He thinks rheumatism and alcoholism are positive factors.

In a little pamphlet without date, published presumably during the time of the French Directory, by the Citizen Sarazin, Chirurgeon, entitled *Instructions on the General Causes of Aneurism*, which may be found in the library of the Surgeon-General of the Army, it is stated that among the classes of food which are the most pernicious of all, and which contribute more to the destruction of the arterial coats than any others, are the acid unripe fruits, and the immoderate use of wine. Bad hygiene, especially of prisons, and the air in the vicinity of latrines, are stated by this author to be frequent causes. He also lays stress on climatic influences, and stated that in his opinion this is the principal and most ordinary cause of aneurism. He enunciates the truth, which modern statistics bear out, that this disease is ordinarily seen in those places where the atmosphere is usually humid, and of a high temperature. Also—

> "The people who live in the valleys of the South, those whose constitution is feeble and delicate. The humidity of the air, with violent heat, produces a constant impression on the body to relax the vessels already enfeebled, and the same causes which produce other dangerous maladies produce this. Familiar experience proves that heat diminishes the action of all the solids of animal life, it evaporates the liquids considerably, relaxes the bloodvessels, and increases their capacity, and it is only with cold weather that they are again given their tone. If a capillary is examined under the microscope while the animal is living, and then a certain degree of heat is presented, it will be seen that this heat considerably distends the arteries and the veins, and when cold is applied they then contract. The habitual use of non-nutritious diet during the time when the body is growing, also aids in the formation of aneurism. The first years of life, when

the solid parts of the body are elastic, soft, and very dilatable, is that which requires more food to enable the body to sustain the force of this fatigue. It is proved by the narratives of travellers, and by the observation of naturalists, that the use of meat gives to man a very remarkable vigor, and renders the circulation more active. Aneurisms, therefore, often depend upon the force of the great vessels of the heart, the principal agent in the progressive movement continually made by the fluid blood. He observes that in London, one of the largest seaports, the men drink much wine, and therefore their bloodvessels on the surface of the body are often varicose, and excessively dilated. They are subject to frequent hemorrhages, and very great mortality. These accidents are common to the people of the North, to whom spirituous drinks are indispensable, by reason of the rigor of their cold climate. It is particularly in those icy climates where liquor is drank with the most impunity, because the bloodvessels are unnaturally compressed through the effect of the cold."

The Citizen Sarazin was thus far in advance of his predecessors and contemporaries. Indeed, we may say, he was a century in advance of his time; and, with certain exceptions to be hereafter noted, it will be seen that the statements are very nearly correct.

An examination of the writings of the fathers of medicine concerning the cause of aneurism does not reveal any profound knowledge of the subject or show that they probed beyond the general exciting causes which produced them. Galen says:—

"It happens in consequence of the skin in the neighborhood of a wounded artery cicatrizing, whilst an ulcer remains in the vessel, which neither becomes agglutinated nor cicatrized nor filled up with flesh." Aëtius is of opinion that it occurs most frequently in women "during parturition, on account of the forcible detention of the spirits." Fernelius has no positive opinion, but evidently differs from Galen when he says: "It is scarcely credible that some imagine that in these affections the vein or artery is ruptured or opened; for if the blood has escaped from the vein or artery, it would soon putrefy, and give rise to tumor of a different kind." Gorræus is not much more satisfactory in leading us to suppose that he knew much of anything about the subject of aneurism, although he arrives at the general conclusion that it is due either to a "powerful compression or an increased movement of the spirit, in consequence of which the vessels being distended give way; or from the vessel being divided with the superficial skin, whether accidentally or by the unskilfulness of a surgeon in bloodletting when he punctures an artery instead of a vein."

Ambroise Paré, in reviewing the works of his predecessors, takes a further stride in discussing the causation of aneurism, and writes: "It may also be occasioned" (he adds to Galen's causes) "by the wound of an artery, the superjacent skin closing and cicatrizing, whilst the wound in the vessel remains without being agglutinated, blocked up, or closed by flesh. Aneurisms may thus be occasioned by anastomosis, diapedesis, rupture, erosion, and wound." Jacques Guillemeau, following the opinion of the ancients, says that "an aneurism is occasioned when the blood and spirits pass out of the vessels, in consequence of their orifices being opened, which is said to be by anastomosis; or when the coats of the artery are divided or ruptured, either from a wound or any other cause." Sennertus, after examining the doctrines of the older writers, concludes that "the approximate cause of an aneurism is an opening in the internal tunic and a dilatation of the external one." Fabricius informs us that "whatever kind of aneurism may follow a wound, either none of the coats, or, at most, the internal one only, is opened, the external one always uniting."

Robert Wiseman, the "Father of English Surgery," divided the causes of aneurism into internal and external: the former cause is from the "impetuosity of the blood, which, moving with greater violence in its channels than the artery can sustain, doth force its way through the side of the vessel, and, bursting a hole in it, doth issue into the space that lieth between it and the neighboring muscles and framing itself a nest." He also thought that the character of the blood, "being too sharp or thin, erodes the vessel; or, being highly fermented by other causes, bursts through all."

Lancisi was a little more explicit in his theory of the causation, but had not divested himself of the old theory of "humors and spirits." In his inquiry into the proximate or internal causes he found "no less than three which may either act singly or together. The first appears to be the concurrence of two blows in opposite directions, acting at the same moment on the same part of the artery. The second is the natural weakness of the arteries. The third is the existence of morbid humors in the body of the person struck."

As far as I can learn he is the first person who makes mention of syphilis as the cause, although he quotes Severinus in his treatise "De Novissima Observatione Abscessüs" that aneurisms arise from syphilitic cachexia. Lancisi finally concludes with the assertion that "aneurisms do not arise from paralysis of the fibres covering the coats of an artery."

Alexander Monro, writing in 1733 on the subject of aneurisms, says: "The preceding account of the coats of arteries may let us see that no aneurism can happen unless through some fault of the interior coats," and in a list of the causes he gets no farther than "wounds, bruises, straining, loud laughing, crying," etc. Petit, his French contemporary, has no opinion to offer upon the causation of aneurism, except to say that "when a certain portion of an artery has lost its elasticity it becomes less capable of resisting the impulse of the blood." Haller concludes that it is not "at all improbable that the aneurism has arisen from a large number of osseous scales which did not admit of dilatation, and which were formed of the concretion of a yellow humor." William Hunter in his remarks on aneurism does not discuss the question of causation. Donald Monro, physician to St. George's Hospital, London, in his observations on aneurisms, confesses his ignorance of the causes of aneurism. He says:—

> "The greater part of the true aneurisms we have any account of came of themselves, and no cause could be assigned for their origin. Strainings of the body, and increased momentum of the blood and a stop put to its free circulation through some of the large vessels, has been alleged to give rise to several. . . . . Sometimes a scorbutic or venereal taint, or some other acrimony in the blood, has been accused; at other times particular obstructions or disease of the arteries, at the part where they were dilated, have been said to occasion them. And certainly there must either be a particular disposition of the blood, which renders it capable of softening or relaxing the arterial fibres, or some disorder in the fibres or vessels affected, or a particular quality in the fluids thrown upon such parts before an aneurism can be produced."

But further examination of the writings of our predecessors will be of no avail in the prosecution of this inquiry, and I may close this review by quoting the words of Lancisi, who had himself traversed the ground: "As far as I have been able to ascertain," he says, "a profound silence has been maintained by these very writers concerning those aneurisms of the heart, and of the larger vessels, which have been noticed by more modern surgeons and physicians in their frequent dissections." If we could communicate with Lancisi, we might tell him that, for one hundred years after he wrote these words, the "profound silence" which he bewails was strictly maintained by his successors, as Sarazin's article seems to have attracted little or no attention.

Alcoholism.—All recent writers singularly enough seem agreed that alcoholism, or the inordinate use of intoxicating liquor, is an undoubted predisposing cause of aneurism, but no statistics are brought forward to support the hypothesis. On the contrary, the general statement is made that the disease is most prevalent in England and Ireland, where the abuse of alcoholic drinks prevails; but Sweden and Norway, as will be shown, as well as Germany, are comparatively exempt—and the Germans and Swedes are, to say the least, not famous for sobriety. And the following letter from the superintendents of the three leading inebriates' homes in this country would seem to indicate, if any affirmative proposition can be proved by a negative, that the contrary is the fact:—

Dr. J. A. Blanchard, of The Inebriates' Home, Fort Hamilton, writes me that—

> "We have never had a death from aneurism in this institution, nor any pronounced case of the same during the time I have been in charge, nor, as far as I can ascertain, previous to this."

Dr. Blanchard's statement is also corroborated by Dr. Crothers, the superintendent of Walnut Hill Lodge Inebriate Asylum, as follows:—

> "I have never met a case of aneurism among the inebriates under my care. In the records of 700 cases which I have made, no cases of this kind have been noted. The statement you mention has grown probably from a fact published some years ago in London, that the stevedores or porters on the docks who drank to excess both beer and spirits, and lifted heavily, were found to have aortic aneurisms. In some German work on pathology, a statement has been made that the arch of the aorta was

always found dilated in persons who used spirits. I regret that I have not noted the authority of these statements, not considering them of importance. Theoretically, alcohol could not be the principal cause of aneurism, for the reason that other parts of the body would undergo degenerative changes, and death, long before this condition, would occur. When it appears in alcoholic cases, it must of necessity be due to *other causes largely*."

The letter of Dr. Day, of the Washingtonian Home, Boston, is of the same tenor:—

"In the last twenty-seven years I have treated a little over *ten thousand* inebriates, and amongst all of these cases I have not in a single instance seen an *aneurism* of the *aorta;* and, indeed, I have not seen anything like aneurism, except sometimes an enlargement of the veins of the lower limbs."

Climate.—In regard to climate, I find that the generally expressed opinion that the disease is more common in northern climates is incorrect. Countries in the extreme north are notably free from aneurism.

The most striking feature of the climatic statistics is the large proportion of deaths from aneurism in the State of California. The Census Reports for 1880 show 64 deaths from aneurism in a total mortality of 11,530, representing a rate per thousand of 5,550, the largest of any in the United States. The Health Reports of San Francisco for three years, 1876, 1877, and 1883, show 130 deaths from aneurism in a total mortality of 16,827 from all causes, a rate per thousand of 7.72. In estimating the reasons for this disparity, which operates against California, it must be remembered that the population of California is made up principally of persons who have emigrated thither from different States of the Union and Europe. The census of 1870 shows that of 560,247 inhabitants, 350,416 were of native, and 209,831 of foreign, birth. Less than half of the native population at that period were born in California, and nearly all the remainder were immigrants from the New England and Middle States. Of the foreign born, 54,421 were from Ireland, 48,826 from China, 29,701 from Germany, 17,669 from England, and 10,660 from British America. It will be noted that the large proportion of these immigrants were natives of northern countries, whose climate is entirely different from that of California. The mean temperature of California is about 60°, from which point it does not vary much during the four seasons of the year, and it will be apparent that persons coming from cold climates to this mild, languid temperature, and retaining their habits of life and living under the new conditions, would become subject to those diseases of the circulatory organs which are affected by temperature. The necessities of life being cheap in California, meat especially so, and the people living on stimulating foods and native wines, which are to be obtained cheaply, are known to be prone to excesses in diet and over-stimulation. Add to this the excitement following the opening of a new country, where the precious metals until lately formed the stimulus to exciting labor, we may see some of the prominent causes which have made aneurism such an important factor in the death-rate of California.

Dr. Hayne, of San Francisco, who has studied the predisposing causes of the prevalence of aneurism in California, says (*Pacific Medical Journal*, vol. vi. p. 117) that the nature of the climate, and the occupation of the people are the two great predisposing causes.

Mr. Barwell states that aneurism, which has always been less prevalent on the continent of Europe than in England and Ireland, is increasing there.

The correctness of Sarazin's views that hot climates, with great diurnal changes, and humid air, are a great predisposing cause, is borne out by statistics in a striking degree. It is found that the coast of the United States, with the exception of the most northerly portions, is that in which the disease is most prevalent, and that islands having a similar temperature have a relatively high rate of mortality from aneurisms, as the British Islands and New Zealand. The north coast of the United States is singularly exempt.

The vital statistics of Norway for 1875, 1876, and 1878, covering a total mortality of 44,043 deaths, show but four deaths from aneurism, a rate per thousand of 0.09.

The report of registrar-general for the province of Ontario, 1876, shows but 8 deaths from aneurism in a mortality of 18,623 from all causes, representing a rate per thousand of 0.43.

The State Board of Health of Michigan, in its reports for 1870–76, a period of seven years, reports a mortality of fifteen deaths from aneurism in a total of 85,189 from all causes, representing a rate per thousand of 0.17.

In 10,668 deaths in Iowa, during 1883, but three deaths from aneurism are recorded, a rate of .028 per thousand. In Connecticut, during a period of seven years, comprising a mortality of 71,566 deaths from all causes, 71 were from aneurism, a rate of .009 per thousand.

The statistics of four large cities, showing a total mortality during an average period of five years of 222,637 from all causes, and of which 521 were deaths from aneurism, give a rate per thousand of .312. The U. S. Census mortality statistics of 1880, for the entire United States during twelve months, comprising 776,893 deaths from all causes, of which 478 were from aneurisms, gives a rate per thousand of 0.63, which leaves us to infer that the population of cities is more subject to aneurism than the population of the country at large.

Table from the U. S. Census Report, 1880.

	Population.	Deaths from all causes.	Deaths from aneurism.	Rate per thousand.
TOTAL UNITED STATES	50,155,783	756,893	478	0.63+
Alabama	1,262,505	17,929	7	0.39+
Arkansas	802,525	14,812	3	0.20+
California	864,694	11,530	64	5.55+
Colorado	194,327	2,547	1	0.39+
Connecticut	622,700	9,179	2	0.22—
Delaware	146,608	2,212	2	0.90+
Florida	269,493	3,159	3	0.95+
Georgia	1,542,180	21,549	9	0.42—
Illinois	3,077,871	45,017	15	0.33+
Indiana	1,978,301	31,213	9	0.29—
Iowa	1,624,615	19,377	4	0.21—
Kansas	996,096	15,160	2	0.14+
Kentucky	1,648,690	23,718	8	0.34—
Louisiana	939,946	14,514	23	1.59—
Maine	648,936	9,523	2	0.21—
Maryland	934,943	16,919	8	0.47+
Massachusetts	1,783,085	33,149	21	0.64—
Michigan	1,636,937	19,743	3	0.15+
Minnesota	780,773	9,037	4	0.44+
Mississippi	1,131,597	14,583	7	0.48—
Missouri	2,168,380	36,615	12	0.33—
Nebraska	452,402	5,930	1	0.17—
Nevada	62,266	728	2	2.75—
New Hampshire	346,991	5,584	5	0.88—
New Jersey	1,131,116	18,474	17	0.92+
New York	5,082,871	88,332	93	1.05+
North Carolina	1,399,750	21,547	5	0.23+
Ohio	3,198,062	42,610	15	0.35+
Oregon	174,768	1,864	3	1.61—
Pennsylvania	4,282,891	63,881	57	0.89+
Rhode Island	276,531	4,702	4	0.85+
South Carolina	995,577	15,728	9	0.57+
Tennessee	1,542,359	25,919	11	0.42+
Texas	1,591,749	24,735	7	0.28+
Vermont	332,286	5,024	0	
Virginia	1,512,565	24,681	18	0.73—
West Virginia	618,457	7,418	6	0.81—
Wisconsin	1,315,497	16,011	3	0.19—
TERRITORIES.				
Arizona	40,440	291	1	3.44—
Dakota	135,177	1,304	1	0.77—
District of Columbia	177,624	4,192	6	1.43+
Idaho	32,610	323	0	
Montana	39,159	336	1	2.98+
New Mexico	119,565	2,436	1	0.41+
Utah	143,963	2,414	1	0.41+
Washington	75,116	755	0	
Wyoming	20,789	189	2	10.5+

New York (compiled from Health Reports).

Population, 1870 942,292

Mortality Statistics.

Year.	Deaths from all causes.	Deaths from aneurism.	Per cent.
1870	27,175	77	00.27
1871	26,076	68	00.25
1872	32,647	73	00.22
1873	29,084	77	00.26
	115,882	295	

San Francisco (compiled from Health Reports).

Population, 1880 233,700

Mortality Statistics.

Year.	Deaths from all causes.	Deaths from aneurism.	Per cent.
1876	5,669	37	0.70
1877	6,170	45	0.70
1883	4,988	48	0.96
	16,827	130	

Chicago.

Population, 1870 299,227

Mortality Statistics.

Year.	Deaths from all causes.	Deaths from aneurism.	Per cent.
1870	7,323	4	......
1871	6,976	7	......
1872	10,156	0	......
1873	9,557	12	......
1874	8,025	3	......
1875	7,899	2	......
	49,936	28	

New Orleans.

Population, 1870 191,418

Mortality Statistics.

Year.	Deaths from all causes.	Deaths from aneurism.	Per cent.
1870	7,391	16	......
1871	6,059	11	......
1872	6,122	8	......
1873	7,505	9	......
1874	6,798	13	......
1875	6,117	11	......
	39,992	68	

The medical statistics of the Provost-Marshal-General's Bureau, compiled by Surgeon J. H. Baxter, U. S. A., afford some interesting and curious figures regarding considerations of nationality, occupation, complexion, and social condition. There were recorded 501,068 medical examinations of adult males for enlistment in the Union army during the Pebellion, 1861–65. Of this number 162,820 were rejected for various causes, and of those rejected 89 had aneurisms, being a rate per thousand of .178.

Relation of Nationality to Aneurism.—The table relating to nationality does not serve as a distinct landmark in our study of predisposing causes of aneurism. 989 applicants for enlistment were natives of Holland, of whom one was rejected for aneurism, a rate per thousand of 1.011. Scotland comes next, the rate being .288, Germany following close at hand with .255, the United States next with .193, Ireland .139, England .063, and British America .046. Fifteen other nationalities are recorded as having no rejections for aneurism, but their relations to the equator are so diverse that questions of climatic influence have no bearing upon an examination of the figures.

Nationality.	Number examined.	Rejected for aneurism.	Rate per 1000.	Number rejected.
Holland	989	1	1.011	......
Scotland	3,476	1	.288	......
Germany	54,944	14	.255	......
United States	341,569	61	.193	......
Ireland	50,537	7	.139	......
England	16,196	1	.062	......
British America	21,645	1	.046	......
Mexico	91	0	.000	.....
South America	79			
West Indies	580			
Wales	1,104			
France	3,243			
Sweden	1,190			
Norway	2,290			
Denmark	383			
Switzerland	1,802			
Spain	148			
Portugal	81			
Italy	339			
Russia	122			
Hungary	89			
Poland	171			
Total	501,068	89	.176	162,820

Complexion.—The statistics of complexion are worthy of some consideration.

There were 117,029 males of dark complexion examined, of whom 13 were rejected for aneurism, a rate .111. There were 217,292 persons of light complexion examined, of whom 36 were rejected for aneurism, a rate of .166, which would apparently show that persons of light complexion are at a disadvantage to persons of dark complexion in the development of aneurism. In the study of the question of sex, social condition, etc., it is universally admitted by all authors that females are less subject to aneurism than males. This is a point in favor of the theory that excessive muscular exercise is an important factor in the production of aneurism when we consider that the table shows precisely that difference between the frequency of the disease in the sexes which would naturally result from the difference in the amount of muscular exertion. The Provost-Marshal-General's medical statistics give a record of 159,393 married men examined, of whom 34 were rejected for aneurism, a rate of .213 per thousand, while of 174,928 single men but 15 were rejected for aneurism, a rate of .086 per thousand, showing an apparent advantage in the case of single men of nearly two and a half to one, from which it might be argued that celibacy was a probable prophylaxis against aneurism, and this, a conscientious recorder is bound to add, seems the *reductio ad absurdum.*

	Examined.	Rejected.	Rate.
Dark	117,029	13	.111
Light	217,292	36	.166
	334,321	49	.147

Social Condition.

	Examined.	Rejected.	Rate.
Married	159,393	34	.213
Single	174,928	15	.086
	334,321	49	.147

Nationality.—In regard to nationality, statistics throw but little light on the subject. The only attempt on a large scale is found in the statistics of the Provost-Marshal-General's Bureau. The statements in regard to racial predisposition seem to have no better foundation than those in regard to syphilis. The statistics cover the examination of 501,068 men for enlistment, of whom 89 were rejected for aneurism. The "jugglery of statistics" is singularly shown by this table, for the large percentage found among Germans looks curious, when taken in connection with the admitted fact that Germany has a very low percentage of aneurisms.

Occupation and Temperature.—As to occupation, there seems no doubt that soldiers and merchant sailors are largely predisposed to aneurism. The statistics of the British Army, as set forth by Inspector-General Lawson, show a greater mortality than in our own.

The question of occupation to aneurism as studied in the following table only affords us presumptive evidence.

Relation of Occupation to Aneurism.

	Total examined.	Aneurism.	Rate.
Gunsmiths	466	1	2.146
Servants	1,083	1	.923
Grocers	1,107	1	.903
Masons	2,618	2	.764
Tailors	2,787	2	.718
Cabinet-makers	1,475	1	.678
Miscellaneous occupations	1,617	1	.618
Millers	1,828	1	.547
Tobacconists	1,964	1	.509
Boatmen	4,669	2	.428
Merchants	4,718	2	.424
Carpenters	11,740	4	.341
Blacksmiths	6,105	1	.164
Farmers	137,425	22	.160
Sailors	9,219	1	.108
Mechanics	10,422	1	.096
Laborers	59,464	4	.067
Bakers	1,975	11	.506

Of 72 occupations recorded, but 18 have been credited with rejections for aneurism, and of these, if percentages be counted, gunsmiths head the list with the enormous rate of over 2 per thousand, while the unskilled laborer has only .067; but there was only one case reported among gunsmiths, and a small number examined. The largest number of persons examined belonging to any one occupation was that of farmers, of whom 137,425 were examined, and 22 rejected for aneurism, a rate of .160, which may be set down as the nearest approach to certainty of relation of occupation to disease among all the persons examined, for it is manifest that the percentage obtained by gunsmiths is due to the small number examined.

The influence of occupation is well shown in the statement of Inspector-General Robert Lawson,[1] that in 1866 the deaths from aortic aneurism in the English Army were eleven times more frequent than among the civil population. A statistical comparison of the occurrence of all forms of aneurism gave:—

0.36 per 1000 among men of the Footguards and Line in the United Kingdom during 1862–65. (176,320 men.)
0.10 per 1000 among 217,170 men in the navy during the same time
0.09 per 1000 among 507,405 men (?) of the civil population of London in the year 1861.
0.9 per 1000 among 29,930 men of the white troops at Cape Colony during 1860–66.
0.7 per 1000 among 42,482 men of the white troops in New Zealand during 1860–66.

The navy list shows less mortality than either merchant sailors or soldiers. Much of this apparent exemption is doubtless due to the fact that they are invalided and discharged as soon as the disease is discovered, and thus swell the civilian rate. It is greatly to be regretted that the earlier Marine Hospital records do not show any rating of the men, on account of the Master's Certificate following the statutory definition of the term seaman. Thus, from the statistics, it is now impossible to prove what has been a matter of belief in the service, namely, that firemen are as subject to aneurism as they are admitted to be from heart disease and apoplexy with resultant hemiplegia. But in regard to the British Army, it is to be observed that the statistics are mostly drawn from the troops stationed in India, at the Cape of Good Hope, Honduras, and the West Indies, where the influence of climate has unimpeded sway, and at these points it is not believed that civil statistics would show any marked difference.

On investigation, however, I am compelled to think that firemen are not particularly subject to aneurism.

With a view of settling this question, I requested Passed Assistant-Surgeon Carmichael, of the Marine Hospital Service, now stationed at Pittsburgh, to investigate the diseases of glass-blowers and iron-workers, knowing that class of men to be exposed constantly to extremes of heat and rapid cooling off. The following is his report:—

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[1] Army Medical Reports (1866), vol. viii. p. 548.

"I have the honor to forward mortality reports compiled from the death registers of the Pittsburgh Board of Health, with reference to the prevailing fatal diseases among glass and iron-workers, commencing with the establishment of the Board of Health in 1870, and ending in 1883. I can discover but two cases of aneurism returned as such, though the number of deaths returned under the vague term heart disease is considerable.

"Diseases of the respiratory organs, including phthisis pulmonalis, as shown by the tables, cause the largest number of deaths among the workers in glass and iron. Attention is called to the number of cases of abscess of the liver, an affection said to be caused by exposure to a continued high temperature. The information obtained from those in charge of glass and iron factories, with reference to the health of the men employed, was unsatisfactory; some maintaining that those occupations were not injurious to health, and that the men employed by them lived to a good age. Others professed that they knew little respecting the health of the men employed by them, but thought they did not lose any men from sudden death. The temperature to which some of these workers are exposed is remarkable. I am informed, by the chemist of the Edgar Thomson Steel Works, that the men who work in the cupolas above the converters are exposed to a temperature of 145 degrees F., and work on half-hour shifts. He also informs me that their men suffer from diseases of the respiratory organs, owing to the sudden changes of temperature and the habit of drinking ice-cold water when the body is in a heated condition. Whether the latter would have any effect or not I cannot say, but the tables show that a large number die from lung affections. As I had no definite means of obtaining the average length of time a glass or iron-worker was employed, I thought it best to state the ages of the deceased, which you will find appended to the report for each year."

The tables[1] accompanying the report substantiate in every particular the views expressed. Total number of deaths in 14 years (1870–1883) among this class of laborers, 834; of which 2 were from aneurism—a rate per thousand of 2.39.

I also requested Surgeon Sawtelle, of the Marine-Hospital Service, to examine the fire-rooms of six ocean-going steamers, six harbor-tugs, and six ferry-boats, as affording accurate knowledge of the condition of the fire-rooms, and the statements of the engineers were taken from the log of the engine-room.

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[1] Owing to the elaborate and extended character of these tables, I am reluctantly compelled to omit them.

List of Ocean Steamships, Tug-boats, and Ferry-boats, with average temperature of fire-room in each case, when under way, as furnished by the engineers of the respective vessels.

Date.	Name of vessel.	Route.	Average temperature of fire-room as estimated by engineers.
	STEAMSHIPS.		
April, 1884.	City of Berlin.	New York to Liverpool	110°
“ “	Santiago.	“ “ Havana	120[1]
“ “	San Marcus.	“ “ Galveston	90[1]
“ “	City of Puebla.	“ “ Vera Cruz	92
“ “	Neptune.	“ “ Boston	98
“ “	St. Romans.	“ “ London	86[1]
“ “	Finance.	“ “ Rio	107½[1]
	TUG-BOATS.		
“ “	Gus. C. Adams.	New York Harbor	107½
“ “	John Fuller.	“ “ “	115
“ “	James Roy.	“ “ “	105
“ “	Edwin Hawley.	“ “ “	117½
“ “	Cyclops.	“ “ “	110
“ “	F. D. Spraker.	“ “ “	100
“ “	W. H. Vanderbilt.	“ “ “	100
“ “	H. I. Vosburgh.	“ “ “	100
“ “	Ivanhoe.	“ “ “	95
	FERRY-BOATS.		
“ “	Southfield.	New York to Staten Island	110
“ “	Northfield.	“ “ “ “	100
“ “	Westfield.	“ “ “ “	100
“ “	Middleton.	“ “ “ “	95
“ “	Fulton.	“ “ “ Brooklyn	110
“ “	Farragut.	“ “ “ “	110

Average temperature for steamships	100+
“ “ “ tug-boats	105+
“ “ “ ferry-boats	104+

The average temperature of the fire-room of ocean-going steamers while under way is shown to be 100+, of harbor-tugs 105+, and of ferry-boats 104+. The maximum temperature was reached in the case of the steamer “Santiago,” plying between New York and Havana, and the second highest on the “Finance,” plying between New York and Rio de Janeiro; the first, 120°, the second, 107°. The lowest fire-room temperature was in the case of the steamer “Romans,” plying between New York and London, 86°. A singular feature in the table is that the vessels showing the highest temperature are said to be “well ventilated.” Notwithstanding the high temperature to which firemen are thus constantly subjected, it does not appear that they are more subject to aneurism than other classes of sailors. These facts, together with the mortality statistics of the workmen on shore, where they are subjected to even higher temperature, would indicate that increase of temperature alone is not a specially predisposing cause of aneurism.

SUMMARY.—In conclusion, it will be seen that, as far as this inquiry has extended, the only constant element among all the alleged causes of aneurism is that of climate; that neither syphilis nor alcoholism, nor occupation, nor heat alone, appears to have an appreciable influence on the causation of this disease. As to how far the influence of diet may extend in the production of aneurism, I have been unable to form any conclusion, but it is possible certain kinds of food may have a powerful influence. There are, as far as known to me, no systematic statistics showing the daily food of the population in any considerable portion of the earth. We know in general terms that the Eskimo eats whale blubber and seal fat, that the Chinese eat rice, with now and then a sucking pig, and that travellers have told us that the poorer classes of Sweden live on the most meagre diet with which it is possible to sustain life; but these statements are mere rambling generalizations. Let us trust that the United States in its new bureau of labor statistics, which I believe is obliged to gather statistics on this very point, may at least give us something definite, which may throw a light not only upon the particular disease in question, but upon all other acquired diseases. There is no doubt that any study into the causation of *any disease* is incomplete which does not take into consideration the food as well as the environment of the individual. Medical geography is important, but the study of alimentation is quite as important.

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[1] Fire-room well ventilated.

Frequency of Aneurism among Merchant Sailors (from Marine Hospital Reports).

Year.	No. of patients.	Mortality.	Cases of aneurism.	Deaths from aneurism.	Per cent.
1872	13,156	521	8	5	
1873	13,529	646	7	7	
1874	14,364	452	15	1	
1875	15,009	462	12	4	
1876	16,808	434	11	2	
1877	15,175	379	11	2	
1878	18,223	324	15	7	
1879	20,922	387	10	7	
1880	24,860	359	15	5	
1881	32,613	455	22	6	
1882	36,184	485	23	7	Rate per
1883	40,195	502	27	9	1000
	261,038	5416	176	62	.114

ARTICLE VIII.

THE THERAPEUTIC USE OF IODOFORM-COLLODION, ESPECIALLY IN NEURALGIAS. By WM. BROWNING, of Brooklyn, Physician to Department for Nervous Diseases, Long Island College Dispensary.

IT is our intention, in the present article, to give some experience with this remedy, together with notes on the preparation itself and a brief study of its action.

A detailed review of the previous uses of this solution is hardly necessary. Of late it has been much used in surgical dressings,[1] but it has also been advocated notably by Germans[2] in a few nervous troubles. My experience with it extends over a period of 3–4 years.

The method of application which has proven most satisfactory will be given first, then cases, and finally its action and the conclusions arrived at.

It is, of course, understood that this is an external remedy. The strength usually employed has been 1 of iodoform to 15 of collodion. Moleschott recommends a 10 per cent., and Cösfeld a 5–20 per cent., solution, while one of only 3 per cent. is sometimes used. A half ounce is usually sufficient for any ordinary single application. It keeps well if the bottle is properly corked, though a change takes place in it—iodine, as will be shown, being set free.

I have found it most effective when painted on in very thick layers. This is conveniently done with the usual camel's hair brush. As soon as one coating becomes a little firm another is applied, and so on until it appears to have an average thickness of 1–2 mm. Where contractile collodion is used, it should, by preference, be applied early in the day, that the patient's sleep be not disturbed, since it continues to shrink for some hours, and may thus occasion discomfort, though this is usually minimal compared with the neuralgia.

The paper-like layer will begin to break off in a day or two, and may be completely removed after forty-eight hours. If it cracks previously, a little oil or vaseline may be rubbed in. The nitro-cellulose is originally dissolved in a mixture of sulphuric ether and strong alcohol. Neither of these helps much in removing the crusts. I have also tried acetic ether, recommended by Binz, as a much better solvent, but it did not prove very useful, certainly not in removing thick crusts. The best way is to raise up a corner and tear off with a jerk. Of course any hairs on the integument should have been shaven close before applying.

In the neuralgic cases, a cure, when effected, was usually accomplished with one or two applications as just described. Where it simply gave relief, it was, like other symptomatic treatment, repeated accordingly. Starched garments directly overlying the application may become dark blue, to the consternation of the patient, until the cause is explained. The yellow iodoform powder will also rub off somewhat after the coating has become dry. These little inconveniences might doubtless be avoided, if thought worth the trouble, by repainting, as soon as it is dry, with non-medicated elastic collodium, or, as has been suggested, with solution of gutta-percha. Occasionally patients speak of the spot feeling cool, perhaps meaning over-sensitive to cold, for some time afterwards. This, and occasional excoriation and slight pigmentation, are the only subsequent annoyances which I have noticed.

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[1] Of course its use in surgery, and, *e. g.*, as recently recommended by Lyttle, in erysipelas, depends largely upon its antiseptic properties, and is for a purpose totally different from ours.

[2] Perhaps the first person to use iodoform in nervous affections was Kennedy (*Phila. Med. and Surg. Reporter*, May, 1867, and January, 1870), but his cases are not very clear. He used it for the most part internally, but later sometimes as an ointment. The first mention which I find of the use of the solution in collodion in these troubles is by Moleschott (*Wien. Med. Woch.*, 1878, Nos. 24, 25, and 26), who began using it about 1870, and refers to Kennedy. To Dr. L. Conrad, of New York, I owe my first knowledge of its possible usefulness in neuralgias.

Supraorbital Neuralgia.

Case I.—A man of 39 years, who claimed to have suffered from attacks of pain in the right frontal region for eighteen years. It had, however, never before lasted so long at one time—already two weeks. He could give no cause for his trouble; no history of malaria or syphilis. He had an unusually long, narrow skull, the more noticeable from his being a German. Dolorous point at exit of right frontal nerve. He was treated with a great variety of measures in the course of the first month; amongst others, internally with quinine, iodide of potassium, opium, digitalis, and salicylate of sodium, locally with cold, leeches, a veratrum ointment, and liniments of turpentine, camphor, ammonia, and chloroform. Yet, despite all efforts, the neuralgia persisted with only slight, transient improvement, chiefly after use of some turpentine liniment.

At the end of a month he was taken with typhoid fever, which ran a moderately severe but short course. Until fairly convalescent, a period of about two and a half weeks, he had no trouble from the neuralgia. Then it set in again, not at first as severe as formerly, but soon becoming so. The previous remedies now failed completely, whereupon a thick coating of iodoform-collodion was applied. It sufficed to dispel the pain, but left an indefinite tenderness; this with the pain-point disappeared after the second coating. The patient perceived no further unpleasant or peculiar sensations. He remained eighteen days longer under observation without any recurrence.

Case II.—A large, blonde, healthy-looking man of 32 years, who stated that he had suffered a year previously from malaria. Claimed to have been feeling unwell this time for about five weeks. Began with pains in various parts of the body—nothing very definite. After taking a Turkish bath, the pain settled in the left half of the head, being especially severe about the forehead. The pain was worst about midday. Left eye constantly full of tears. The points of exit of the left supraorbital, and in a less degree of the left occipital nerves, were sensitive to pressure. Said he had already taken quinine without avail. It was given again very faithfully, but to no purpose.

Two applications (interval of two days) of the iodoform-collodion to the distribution of the left supraorbital nerve sufficed to disperse all subjective symptoms. The sensitiveness of the pressure points had vanished. The profuse lachrymation lasted one day longer. He was seen fourteen days later, and had had no relapse.

Case III.—Thin, nervous man of about 45 years, suffering from malaria. There was reason to suppose that the too industrious pursuance of his marital privileges was part cause of his nervous condition. His chills were soon stopped with quinine, but a severe supraorbital neuralgia of one side persisted. One application of the solution remedied this. He did not continue either cure longer, though urged to do so. Some weeks later, I had a note from him saying that the chills were back again, but of the neuralgia he made no mention.

CASE IV.—Lighter than the preceding ones, of apparently malarial origin, and where quinine had helped, but did not entirely cure; the solution was also successful, although slower in acting.

CASE V.—Well-built man of 47. Works in a rather moist basement. First suffered from supraorbital neuralgia while in the army, twenty years ago. At that time it affected the left side. A sister said to have attacks of the same trouble. Thinks he acquired malaria in France some years ago, and that one attack of neuralgia was cured with a quinine mixture. Has had several attacks, oftener, as now, in the spring. The present very severe one had lasted a week already. Pain chiefly in right frontal region. Begins about 6 A. M. and lasts until a little after noon. He had used various strong liniments with little effect, though, on the whole, it was not quite so severe as at first. Exit of right supraorbital nerve oversensitive to pressure. Quinine was given for two days without any noticeable improvement. It was then coated at evening with a thick layer of the solution. In his own words, "Pain returned next day, but not quite so severe; again a little less on second day, and on third there was none at all, but only a little soreness."

Dr. McNaughton, of Brooklyn, has favored me with the three following cases. He directs his patients, in case severe pain returns in a few hours, to remove the whole coating and apply afresh. He uses contractile collodion.

CASE VI.—An anæmic girl of 22 was attacked for the first time with right supraorbital neuralgia. Codeia internally. Iodoform-collodion locally. Next morning no better. Through a misunderstanding the codeia was dropped and the solution continued. By night the pain had disappeared. Relapse at end of a week. Remedied forthwith in the same manner.

CASE VII.—Married lady of about 30. First and only attack about a week after confinement. Unusually severe. Whole region tender. Three separate coatings in 2–3 days completely cured. No relapse at end of 8th month, though lachrymation in corresponding eye at times since.

CASE VIII.—Man of 35 years with measles. Neuralgia of supraorbital set in with the appearance of the eruption on the head. The solution freely used gave no relief. The neuralgia lasted 5–6 days in all, and could only be relieved by hypodermics of morphia. No relapse in the 5 months since elapsed.

It was thought that there was some neuritis in this case. Evidently the neuralgia had some close connection with the measles-eruption.

A ninth case has been kindly reported to me by Dr. Bender, of Brooklyn.

CASE IX.—Man of 40 years, suffered a year previously from malaria, and seemed to be still suffering from a kind of malarial cachexia, although he had now no chills. His present complaint was a bilateral supraorbital neuralgia. Two or three applications (very thick) of iodoform-collodion quite relieved this. The neuralgia had not previously been treated in any way, but he received some quinine at the same time as the painting.

Dr. Bartley, some time since, also told me of at least one case where he had used it successfully. I have used, and known of its being used with advantage in several other cases of this affection, but cannot furnish the notes. It is proper to add that I have not known of its failure in any case of simple or idiopathic supraorbital neuralgia, and even brow-ague; although if the number of cases were larger there would naturally be failures to chronicle, as is the case with the best of remedies.

Eight cases at first resembling lumbago or sciatica, but proving either on immediate examination or subsequently to be as follows:—

CASE X.—Cheesy softening of two lumbar vertebræ with consequent bilateral psoas abscess, in a man of about fifty years (autopsy). In the middle stages of the trouble, which lasted 1½ to 2 years, considerable amelioration of the patient's severe pain was secured by repeated local use of the solution.

CASE XI.—Tumor, size of fist, on inner surface of left os ilium with severe pain there and in lumbar region. The solution in front and over small of the back gave more relief, though of course but transitory, than any other measure. It seemed as if the tumor itself diminished in volume under the repeated applications. He went to work again slightly improved, and was lost sight of.

CASE XII.—Partial anchylosis of both hip-joints in a man of 48. Much pain on outside of thighs. Local use of the solution gave no relief from the pain.

CASE XIII.—Incipient spinal affection, at first simulating lumbago, the more so since patient claimed to have had previous attacks. The solution over the seat of pain and stiffness quite relieved him. After a time he came again, when the benefit from it was less. When last seen he had some symptoms of spastic spinal paralysis.

CASE XIV.—Tumor of kidney (autopsy), with pain in lumbar region. No benefit.

CASE XV.—Bladder trouble with severe lumbar pains, much relieved for brief periods by the solution.

CASE XVI.—Chronic kidney trouble, possibly of gouty nature. The pain in sacral region and thighs was at first somewhat relieved by the application.

CASE XVII.—Lumbago (myalgia) in a young man with a marked prominence of one of the lumbar vertebræ; this latter he claimed to have had from childhood. The severe, subjective, radiating and local pains were only slightly improved by the solution, though the diffuse tenderness to pressure, and the points were dispersed as far as the application extended. (Cured with faradic brush.)

Amongst these there is no case of idiopathic sciatica (recognized by some high authorities, *e. g.*, Paget, as rare), and at most but one of lumbago, viz. Case XVII. In the first seven of the series there was some tangible deep-seated cause, and of so serious a nature that any permanent improvement from this remedy was not to be expected.

Various Neuralgias.

CASE XVIII.—Intercostal neuralgia over right mamma in a man the subject of extensive arterio-sclerosis, and presenting nephritic symptoms.

This was completely relieved by a single local application. There was no relapse for a few weeks, but I believe he subsequently complained a little of similar pains, whether in the old spot I cannot say.

CASES XIX AND XX.—In at least two other cases of intercostal neuralgia (pleurodynia?) it proved successful.[1]

CASE XXI.—Man of 29 years. Had a tooth drawn not long ago. Since then has suffered from what appears to be a neuralgia of the left facial nerve; its exit back of jaw painful on pressure. The solution locally. Cure. No relapse at end of 6 months.

CASES XXII AND XXIII.—Two cases of inframaxillary neuralgia (teeth sound) cured in this way have been related to me by medical friends. In these it would appear, from the suddenness of the relief, that the ether was perhaps the chief agent.

CASE XXIV.—Man of 42 years. At a recent fire he caught cold in the left side of the neck. Pain is severe in the morning, lessens about 9 or 10, but gets worse again towards night. Can hardly sleep more than an hour, when he becomes restless. The fear of increasing the pain makes him keep his head very fixed. Pain runs at times into the shoulder or up to the ear. Very tender to pressure over the left occipital nerve, but not elsewhere. (It appeared to be rather a slight neuritis than a simple neuralgia.) Reports himself relieved by the solution, with a partial relapse three weeks later, which was again remedied in the same way. Whether the cure was then permanent cannot yet be stated.

CASE XXV.—Obstinate occipito-cervical neuralgia. Points of exit of occipital, and in less degree of frontal nerves, decidedly sensitive to pressure. After two applications to both regions the pressure-tenderness had quite disappeared, but the neuralgic pains and general subjective condition were not essentially altered. Pressure-sensitiveness returned to a slight degree after a couple of months, but never became marked again. [This case I have ventured to call an occipito-cervical neuralgia for want of a better term. Neuralgias having this seat are known to be very obstinate.]

Spinal Irritation.

CASE XXVI.—Thin, middle-aged workingman. Pain in middle dorsal region of back while standing or moving; "cramps" encircling upper part of abdomen, especially about stomach. Great tenderness of the said spinal region on pressure, soreness when lying on it, etc. No known cause unless bending over his work. Cold locally and rest were first tried, but to no great purpose. The iodoform-collodion was then used. It relieved so far that he returned to his work, though he still felt some "uncomfortableness" at the back. Not seen again.

CASE XXVII.—Woman. Hyperæsthesia along spine and in lower limbs. Great tenderness to pressure laterally from the spinous processes in two places, one in lumbar, the other in dorsal region. After the hyperæsthesia had been diminished by the electric brush, the two regions were coated with the solution. On removing this a day or two later, the pressure-tenderness at the nerve exits had completely disappeared. Subjective relief was, however, minimal, and it was not thought best to repeat the procedure.

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[1] Moleschott mentions curing an intercostal neuralgia with syphilitic myocarditis by the external and internal use of iodoform for months. Not a very close parallel to my cases.

Case XXVIII.—Lady with mild attack of spinal irritation. (Tenderness laterally to dorsal vertebræ, etc.) The solution gave temporary relief, much the same as did collodion alone.

Case XXIX.—Woman of 31 years. Distressing pain and sensitiveness between shoulder-blades, especially when stooping or at work. Marked pressure tenderness about region of second or second and third dorsal vertebræ. Stout, otherwise healthy woman. Iodoform solution (1 : 12) locally. Improvement even subjectively, though there is still some pain in the arms and left shoulder. The spot formerly so sensitive can now be freely pressed, but there is a less tender spot two inches to the left of the old one.

These four cases, perhaps, illustrate the opinion of Anstie, that local applications are sometimes very successful, often, however, of no value. The internal administration of iodoform in spinal irritation has been recommended by Busch. On the whole, the solution will hardly be worth trying, except in slight and regionally limited cases of this affection.

The solution was also tried in a number of cases of enlargements of and effusion into joints, but not always with abiding benefit. In several cases of subacute and chronic rheumatic swelling of the *smaller* foot and hand joints in young adults, it did more than any other remedy. One young man, the balls of whose toes had for a long time been so tender that he could hardly step on them, was thus brought to his feet again—although not completely cured, even after several coatings. Another youth, a grocer's boy, with subacute swelling and tenderness of the middle tarsal joints, was thus cured. His first acute attack had been remedied quickly with salicylate, but this second less severe one did not yield to that remedy. He had had no relapse when I saw him again some time after. In certain other cases apparently as favorable as the above, no advantage was obtained. In one where finger and elbow-joints were the seat of swelling, only discomfort resulted. In another of chronic effusion into a knee-joint, no effect was derived from repeated use of this agent.

The usual procedure in these joint cases was like that previously detailed, a thick layer, and, where admissible, quite around the joint. With knee and elbow the popliteal and cubital spaces should be left free.

The mechanical compressing action of the contracting collodion[1] is in these cases one of the chief factors, and in applying regard should be had to securing this effect. To this principle Gamgee has recently called attention in connection with orchitis, etc. In this and in hydrocele it is rather customary to employ the solution in elastic collodion; the contractile, however, I have also found more effective. A good thick layer tears the skin less than a thin one.

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[1] Collodion alone has been recommended for local use in acute rheumatism, *v. Phila. M. & S. Rept.*, 1880.

Besides the above cases I have tried the solution in at least an equal number of others; in some with success, but where complications or want of notes render them unavailable here; in others, mostly hopeless troubles, from some imagined analogy, without serious expectation of good resulting. These can be made use of only in discussing certain points. A trial of it in locomotor ataxy might be cited. It was thought that possibly the lancinating pains could be relieved in this way. The solution was repeatedly applied to considerable lengths of the spine. Effect, *nil.*

In regard to its action this solution is only to a limited extent a counter-irritant; it is much more gradual in accomplishing its full effect. There are some four principal ways in which its ingredients exert an influence:—

1. Ether and alcohol—rapid local anæsthetic.
2. Nitrocellulose—mechanical by its contraction.
3. Iodoform—slow local anæsthetic.
4. Iodoform and free iodine—absorbefacient.

1. The evaporation of the ether and alcohol produces a degree of cold sufficient for the time being to drive the blood pretty completely from the immediate tissues, and reduces very markedly the cutaneous sensibility. Ether pure has been much used for this latter purpose, either as spray, or, as advocated by Hughes, in form of lavements and douche. The application of simple collodion for this purpose is often preferable to either of these methods. It seems to stick to the skin more tenaciously than the solution. The latter will in some cases dispel neuralgic pain in a few minutes without its returning. Here it is doubtless the ether that acts, although the iodoform may help to establish the cure. To the suggestion that in all cases it is the collodion and not the iodoform which relieves, it may be replied that in some cases, as, *e. g.*, Case 5, a *gradual* cure was effected by a single application, similarly in other cases by two applications. That in these cases it could hardly have been the contraction of the drying collodion is evidenced by some cases remedied by a solution in elastic collodion.

2. Then follows the powerful action of the contracting collodion. It not only keeps the skin very anæmic, but pulls vigorously on the nerve-endings, and this is kept up with increasing force for at least 6–8 hours. The effect of such contraction can be best studied after applying pure collodion, the membrane thus formed not obscuring the structures beneath. It pulls the skin from all directions, producing, if the area be large, folds and even fissures. The shrinkage in one case, where the coating of solution was not very thick, amounted to $\frac{1}{8}$ the diameter (4 to $3\frac{1}{2}$ in.); the area had consequently diminished about one-quarter.

It is known that "neuralgias can be lessened and even suspended completely by strong pressure over the point where the painful nerve emerges from openings in the bone," etc. Inasmuch as the solution is, where possible, also applied directly over such points, we can see that the long-continued pressure, though not so closely directed at the one spot in the nerve, may still have a very similar and more lasting action.

Perhaps protecting the part from air may help to relieve, like the use of pure flexible collodion in herpes. Dr. McNaughton tells me that in two cases of herpes quick and almost perfect relief was afforded by iodoform in elastic collodion, though possibly not better than might have been afforded by pure collodion.

3. As to the action of the iodoform there is more question. Its fresh solution in collodion is nearly colorless, slightly yellowish. On standing it gradually acquires an amber and presently a brownish red color very like that of tincture of chloride of iron. This must be due to iodine being set free, since it then gives the starch reaction, though iodoform powder alone or its fresh solution does not (*v.* also Odin, *Phila. M. & S. Rept.*, 1874, vol. 30, p. 84, who asserts the same and also claims that in red bottles less iodine is liberated).

It is known that iodine is often demonstrable in the urine after painting with its tincture or even after inunctions of iodine salve or oil. Moleschott in one case obtained its reaction in the urine only 25 hours after its external use, and saw it continue in one case five days after its application was stopped. Falkson (*Arch. f. Klin. Chirg.* Bd. 28, p. 112) is inclined from various experiments on animals to believe that dry crystallized iodoform can be absorbed through the intact epidermis. It is in this condition that the iodoform exists either in whole or in part in the dried scales from the solution, as may be seen by comparing them under the microscope with crystals formed from a solution in alcohol. A condition very favorable to epidermatic absorption is produced by the tension of the coating; for pressure is stated by Eulenburg (*Percutane Arzenei-application*, 1880) to greatly promote this. It is therefore presumable that some of the iodoform itself, and of the free iodine when present, passes through the epidermis and still more through minute fissures, on remaining so long in contact with it.

Iodoform has for some years been recognized as being either in strong solutions or in substance a very powerful local anæsthetic. It was originally used for relief of pain in open cancers, sores, etc. A solution of it in chloroform was also recommended for neuralgias. In this form, however, it does not seem to have any established reputation, partly perhaps on theoretical grounds. We believe that its solution in collodion is incomparably superior, and that as regards both efficacy and cleanliness this will prove a really satisfactory method for securing its local action where the epidermis is intact. Perhaps it should be stated that in lighter neuralgic affections a solution in elastic collodion has often sufficed, but where the trouble is obstinate or severe the contractile is far preferable.

This brings us to ask what part of the nervous system is acted upon, and in what way. Is it simply a local anæsthetic? We may recall the theory so strongly urged by Anstie and others, that idiopathic neuralgias are dependent on certain—probably anæmic—changes in the nerve-roots or centres.

If this be true, a remedy that directly cures them must do so by acting on the said central structures. From Schüller's well-known account (1874, reprint) of the effect upon the meningeal circulation, of large sinapisms, it is imaginable that the prescribed application might also have some effect upon the meningeal resp. cerebral vessels. Strange as it may seem, at least two Germans[1] have reported cases of meningitis (tubercular) cured by iodoform collodion, and Moleschott even claims to have cured acute hydrocephalus with it. Whether they accomplished what they believed or not, they seem to have succeeded in deeply impressing central nerve apparatus. From these considerations we must acknowledge that the remedy *may* have a powerful central action. Still, most of my own observations corroborate the view that it has a very decided effect on the peripheral portions of nerves, and that thereupon depended its value in my cases. The fact that in several cases of palpable peripheral nerve-lesions much relief was obtained from this measure indicates that the nerve-trunk was acted upon. Pretty decisive on this point, and otherwise interesting is another result which I have constantly observed. *The points in nerves, painful on pressure, lose this over-sensitiveness after one or two applications.* In simple neuralgias this appeared to occur simultaneously with the cure of the main trouble, but in other cases this was not so. In these (*e. g.*, Cases 17, 25, 27) the pressure tenderness indeed disappeared, but the malady itself did not seem to be much affected. It would therefore seem clear that the peripheral nerve-trunks or branches must have been acted upon. The power of dispelling the sensitiveness of these pain points, without in given cases affecting the main trouble, has not to my knowledge been specially called attention to in connection with any remedy. In these cases the dolorous point cannot be considered as identical with, or the cause of the chief trouble, but rather as consequent to it, the trouble itself being situated in some more central structure. Conversely, neuralgias cured by it are probably peripheral, thus furnishing additional evidence, were it needed, against accepting too widely the theory that their seat is in the posterior nerve-roots.

4. There is reason to believe that the absorbefacient action may also be of value; for, says Anstie, "the true Valleix's point, when it has become established for some time, is the scene of trophic changes involving hyperæmia and thickening of the parts surrounding the nerve." We have seen that the over-sensitiveness of these same points is remedied by the

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[1] Bauer (*Deut. Med. Woch.* 1882, No. 18). Not a very clear case. Cured by use of the solution about neck and head for 4 weeks. Cœsfeld (*ibid.*, 1881, No. 37) believes he cured 2 out of 7 cases.

application. The skin doubtless remains more or less impregnated for some time. Possibly old solutions containing free iodine are more efficacious; if so, we have but to add the tincture to fresh solutions.

Some care should be exercised where the skin is very thin or tender. The method is therefore obviously and from experience less to be recommended in females than in males. In exposed parts of the body it may be objectionable for æsthetic reasons, yet, on the whole, less than the so freely used iodine.

The class of troubles found most amenable to this treatment was narrowly localized neuralgias, especially when corresponding to some particular nerve and not dependent on any demonstrable lesion. In fact, if a neuralgia, or what is thought to be one, proves intractable to this means, we should doubt its being a purely functional affection, and look carefully for some tangible cause. It has thus a certain diagnostic, as well as therapeutic value. Several times its complete or partial failure has led to a more searching and successful examination. Even in such cases much temporary relief is often afforded.

Prolonged use of a solution in elastic collodion might prove valuable in neuritis,[1] though I have never tried it in a well-marked case.

Supraorbital neuralgias, even of malarial origin, particularly if the miasmatic infection dates back some time, seem quite amenable to this treatment. Of course it is not recommended as a substitute for quinine here, but only as an adjuvant where the latter fails or acts too slowly.

In those cases where transient or ill-defined pain is felt, sometimes in one brow and again in the other, with perhaps frequent headaches or pains elsewhere, there is no occasion to have recourse to the solution. The same holds for indefinite and fleeting pains in other parts of the body.

Better results are usually obtained where the medical attendant can make the application himself.

Article IX.

A Consideration of the Classification of Functional Neuroses of the Throat and Nose.[2] By H. Clinton McSherry, M.D., Professor of Diseases of the Throat and Chest in the Baltimore Polyclinic and Post-Graduate Medical School; Fellow of the American Laryngological Association, etc.

Functional neuroses of the larynx, the naso-pharynx, and œsophagus are, in some phases, constantly coming under the observation of all members of the profession, but particularly of the laryngologist, and, in the absence of other marked apparent explanation of the cause, are most frequently classed as hysterical, this being nearly invariably the diagnosis when the condition is noticed in women, and especially if they are not far removed from the age of puberty or are subject to some menstrual disorder.

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[1] Moleschott *l. c.*, thus cured a left sciatic neuritis following typhoid fever.

[2] Candidate's Thesis, presented to American Laryngological Association.

That a considerable proportion of these cases are properly attributed to hysteria cannot be questioned, but that those in which the symptoms have appeared as the result of exhaustion of the nervous system from overwork or mental worry, *i. e.*, from neurasthenia, or where the functional activity of the nervous system is lowered from anæmia, should be so designated, as is not uncommon, appears to be wrong, for in hysteria there has usually been freedom from both physical and mental strain preceding the development of the symptoms, the nervous system is more often in an exalted rather than in a depressed condition, and anæmia is rather rare. Therefore in this article my endeavor will be to define as clearly as possible and reduce to more restricted limits the proper use of the terms "hysterical loss of voice," "hysterical spasm," "hysterical paralysis," etc., and in addition to this to consider briefly the other forms of functional neuroses which affect the throat and nose, believing that in so doing something may be gained in the treatment of these troubles, which are sometimes intractable because they are diagnosticated hysterical in nature, from a want of acumen in searching out the real cause.

The two classes of cases that have been spoken of will be described as, 1st. The Hysterical; 2d. The Neurasthenic; and to these will be added a 3d class, or The Reflex Irritative Cases, in which there are marked perversions in the function of the peripheral nerves in the throat and nose which cannot be placed under the head either of hysteria or neurasthenia, but must be studied under the caption of this paper, as the symptoms presented are not dependent on disease in the parts themselves nor in the nerves supplying them, but in organs or portions of the body more or less remote from the seat of the functional disorder.

As nearly all the throat neuroses are called "hysterical," it is important that the accepted views as to the meaning of this word should be understood, and therefore some statements of recognized authorities will be given. Hammond says that "Louyer-Villermy describes every hysterical woman as stout, dark, plethoric, full of life and of health," etc., because he lived in the south of Europe where women of this description were most common; but, on the other hand, Sydenham, Whyte, Copland, and others who lived in the north of Europe, described hysterical women as having exactly the opposite characteristics;" and he adds that Briquet remarks, "there is no hysterical constitution appreciable by external appearances. The disease takes women as it finds them, blondes, brunettes, stout, thin, strong, weak, ruddy or pale, there is no choice."

Further than this Rosenthal quotes from Briquet's table of one thousand cases that "eighty-seven occurred in children between five and twelve years of age, and fifty in men." Rosenthal says he has seen the condition in children and men, and that Bernutz (*Gaz. des Hôpit.*, 1874) has shown "that the genital organs have been found perfectly healthy in a large number of autopsies on women who were undeniably hysterical, and also that Grisolle (*Gaz. des Hôpit.*, 18, 1853) and Castiaux (*eod. loc.*), have seen congenital absence of the vagina and uterus in two undoubted cases of hysteria."

From these statements it is apparent that the term "hysteria" (ὑστέρα) is a misnomer, as far as it indicates the cause of the condition, but since the name has become arbitrary and conventional, the cases which might be with some propriety included under it should be defined with reference to this conventional usage, and the fact that many women who are hysterical have some uterine or ovarian disease, and that in such cases there is often a relation between the two, must be recognized; but when we consider how many women have disorders of the sexual apparatus without the appearance of any hysterical symptoms, it is fair to suppose that these derangements only develop the condition in those whose psychical or nervous constitution predisposes them to the disease, or, in other words, the manifestations of the state become more marked through the influence of a reflex excitation of the nervous system, but that many of these cases of so-called hysterical throat disorders should with greater propriety be called reflex irritative cases. Erb speaks as follows of the symptoms of hysteria: "They may be produced by disturbances which are the least palpable, and are psychical in nature, particularly the powerfully acting or depressing emotions;" and Charteris defines as the cause, "mental lack of aim in life, throwing the mind and emotions back on self."

These quotations from competent observers have been presented, not for the purpose of entering into the pathology of hysteria, but as leading up to the statement that, in classifying a functional neurosis of the throat as hysterical, we must be guided not so much by sex, age, or menstrual disorder, as by a peculiar psychical state that induces the patient to complain of certain symptoms for which there is a slight justification, but which *appear* to be very similar to those of a malingerer. Handfield Jones describes this state in the following words: "Hysterical is commonly used to designate a patient whose complaints are considered more or less exaggerated, and who is not *bona fide* anxious to get well and cease from being an object of nursing and sympathy." In these cases the symptoms often present great inconsistency, and if routed out by treatment, physical or moral, will frequently reappear in some other form.

Two patients who have been under my care are good illustrations of this class, and their histories will be related here. One of them is a condition ordinarily met with, but the other is more unusual. The first was a young lady who had been relieved of a hemiplegia (hysterical?) after several months of Dr. Weir Mitchell's skilful treatment, but to the great distress of her parents she lost her voice, which had not been previously affected, a short time after her return to Baltimore, and as she had not been able to speak above a whisper for some weeks, she came to me for advice. On introducing the laryngeal mirror, and telling her to say "ah," good approximation of the vocal cords was seen, and a fairly loud clear tone was produced; then the mirror was removed, and she was asked to count one, two, three. This she also did in a good voice by speaking slowly; but on my asking how long she had been unable to speak aloud, she answered in scarcely an audible whisper "six weeks." This patient remained under my care for over a year, and, although I made use of all the means of treatment usually employed in such cases, as galvanism and faradism, externally and internally, the local application of ferri perchlor., and other solutions as well as tonics and nervines internally, while she did regain her voice for a short time after something was done which seemed to impress her imagination, as after the first introduction of the laryngeal electrode, the effect of each particular means of treatment was soon lost, and at the same time the voice disappeared.

This young lady was about twenty-five years of age, was very intelligent and cultivated; her social status was good, and her parents wealthy and devoted to her; yet I think the cause of her condition may have been explained by the physician who brought her to me, when he told me that I must not rely on any statements made about the case by her father, as he was of rather feeble intellect, which leads me to the remark that the hysterical predisposition is, according to Jolly and many authorities, an inheritance from mental and nervous affections. This case looks very like malingering, yet her coming for treatment was entirely voluntary; she submitted with a good grace to all the remedial measures I adopted for over a year, seeming most anxious for the restoration of her voice; and she had nothing to gain in any way by feigning the condition.

The apparent inconsistency of not being able to speak, but being able to sound the voice in pronouncing a single syllable or counting slowly, is sometimes observed as well as cases which no doubt all laryngologists have seen, who said that they were able to sing but not to speak aloud, and also those who could not speak but had at the same time a loud ringing cough, which are probably to be explained by the concentration of the will-power for a special effort, but when the mental faculties are exercised, as in sustaining a conversation, the ability to approximate the vocal cords is lost. Such instances as those mentioned I have from time to time met with; but in the second case, which I am about to relate, I encountered a condition I had never seen before, and which is so rare that I can find no record of it.

This was a young woman about twenty years of age, who said that for some months she had been obliged to keep her mouth open all the time, as it was impossible for her to breathe through the nose. My first idea being, naturally, intra-nasal hypertrophy or polypi, a most careful anterior and posterior nasal examination was made, but no obstruction could be discovered, nor was there any difficulty in passing a flexible, hard rubber probe with a pledget of greased cotton on the end through the nose and into the pharynx. In order to test whether she was malingering or not, snuffs and the inhalation of irritating vapors were used for the purpose of making her sneeze, but without effect, and on a number of occasions when her mouth was held closed there were always evidences of want of aëration of the blood and impeded circulation. Once, however, when her mouth was being held tightly shut by a very muscular medical friend of mine, after the interference in the circulation was shown by the swollen veins and darkened countenance, although there was no perceptible movement of the alæ nasi, there was after a couple of minutes a slight movement of a thread held under the nose. I have been told by a physician that previously to her coming under my care he had treated the girl for some other hysterical disorders. After coming to me for a number of visits she disappeared, and I did not see her again for several months, when she told me that she had recovered the use of her nose for its natural purpose without treatment.

The positive explanation of this case would be as difficult as it is interesting. She was able, she said, and as was demonstrated by her using snuffs, etc., to take a deep inspiration through the nose, but all her attempts at expiration were in vain. There was no paralysis in the nose or of the velum, and, therefore, I am inclined to the opinion that on her making an expiratory effort to breathe with her mouth closed, a spasmodic action was produced of the levator palati, the tensor palati, and perhaps the palato-pharyngei muscles, by which the posterior nasal region was as completely shut off from the lower pharynx as it is when those muscles are called into play to prevent regurgitation of food during deglutition.

To these cases might be added others which are frequently observed, where, when examining with the laryngoscope, and the patient is told to say "ah," there is no approximation of the vocal cords. These, as well as the others, represent the first or hysterical division of functional neuroses. This condition Russell Reynolds describes as follows: "When there is loss of voice in hysteria there is no attempt made to whisper loudly; the failure is evidently not in the apparatus of the voice as a mechanical production, but *in the will to put the machinery into play.*" . . . . "The vocal cords are widely separated, with but slight effort being made for their approximation on attempted phonation," or if there is an attempt made it is ineffectual, for, as Türck states, "in certain cases of hysterical aphonia there is rather a derangement of co-ordination than a paralysis." To this evidence may be added Stoerck's remark, that "it is then in the hysterical nothing but an imitation of the condition, an unconscious want of volition to properly innervate the paretic muscles." When there is a true paralysis of the laryngeal and other throat muscles in hysterical cases, it is due to the fact that the condition has existed for a considerable time, and, as a result of inactivity, a functional atrophy of those muscles has occurred.

In speaking of the treatment of hysteria, Russell Reynolds says, perhaps not altogether considerately, "No human being can cure, the physician can do but little for one who is born hysteric;" and Handfield Jones, relating a case of the same trouble, remarks, "It would clearly have been futile to give physic unless it was the 'infusum benedictum,' which often cured malingering soldiers, compounded of a weak infusion of tobacco and Epsom salts."

Dr. H. K. Oliver proposed a method of treatment of "aphonia from paralysis of the intrinsic muscles of the larynx" by compression of the wings of the thyroid, which, he says, he adopted, because "he took advantage of the valvular nature of the vocal cords," an anatomical fact demonstrated by Jno. Wylie, M.D., F.R.C.S., in a prize dissertation published in *The Edinburgh Medical Journal*, vol. xii. (Sept. 1866), where it was shown that the vocal cords when approximated constitute a valve opening outwards, while the ventricular bands form a valve opening inwards, and on account of this wedge-shaped space below the vocal cords the expired current of air can easily force the vocal cords apart, even when they are tightly closed, but that it will find effectual resistance at the false vocal cords (ventricular bands), where the ventricles will be inflated and the folds brought firmly into apposition. In inverse action, namely, in inspiration the air can easily wedge apart the false cords (vent. bands), whilst the vocal cords become the resisting bodies, and, as Dr. Oliver says, "it only seems necessary to start the machinery in paralysis of the adductors;" he suggests and gives several successful cases, where upon the arytenoids and vocal cords being approximated by compression of the wings of the thyroid, and the patient tried to sound the voice on quick, strong, and sudden inspiration, the power of phonation was restored and the voice was afterwards produced in the normal way.

This method I have occasionally adopted with success, and if other measures were used, have noticed that in hysterical aphonia the sounding of the voice first occurs, usually, if not always, on inspiration, and furthermore, in cases of true paralysis of the adductors the inspiratory effort to speak was decidedly more successful than the expiratory; but the extracts from Dr. Oliver's paper have been introduced because it seems that from them can be demonstrated that the condition he described and relieved in such a simple manner is not due to a paralysis, but to a perversion of the mental function, and therefore the most influential element for the successful treatment of the condition is that which appeals to the mind. It can hardly be admitted that there is, properly speaking, a paralysis of the adductors when all that is necessary to call them into play is an inspiratory effort at phonation, but it is more probable that their action is in abeyance on account of the absence of the will-power to produce the normal movement, and after a few attempts the patient becomes impressed with the idea that it is impossible to speak aloud, and regards the condition as hopeless; when, however, a slight sound is made on the inspiratory effort, whether it be with or without compression of the wings of the thyroid, there is a mental encouragement to make the effort to speak which proves successful.

In addition to the reason given by Dr. Oliver for the ability to produce the voice on the inspiratory effort, it is probable that it may also be partly due to a stimulation of the superior laryngeal nerve, particularly calling into action its motor branch. Hilton says: "No matter how rapidly the nervous influence passes, it must reach the nearest point first, and that is apparently the reason why this little nerve takes so short a course to the crico-thyroideus. It has long been my habit to regard the crico-thyroidei as the muscles which are intended to tune the vocal instrument; and, as the instrument must be tuned before it can be played upon, so this nervous influence first reaching the crico-thyroidei, the vocal cords are put in a due state of tension, preparatory to the more precise and accurate influence of the other muscles acting directly and indirectly upon the vocal cords." He says, also, that if the principal motor nerve of the larynx took the same course, "we would all be ventriloquists, talking inwardly to ourselves," for it would act on the upper muscles sooner than the lower; and this is the way he explains why these nerves are always recurrent, though he says he has seen instances in the dissecting-room where they did not wind around the aorta or subclavian artery. The stimulation of the motor branch of the superior laryngeal may occur through the indirect influence of irritation or stimulation of the sensitive branch, and by its action on the crico-thyroidei muscles produce on the inspiratory effort a tension of the vocal cords which will also approximate them, and thus be an important factor in the sounding of the voice on inspiration, as it no doubt in a measure accounts for the sonorous whoop heard when air is being taken into the lungs, after the convulsive expiratory cough of pertussis, as Rosenthal has shown, according to Bartholow, and that this affection is due to irritation of the superior laryngeal nerve.

The large number of opinions of various authors which have been presented may not have been necessary; but it is believed that they all aid, either directly or indirectly, in establishing the fact that the hysterical neuroses met with by laryngologists are due to a perturbed psychical state, and only those symptoms which are entirely disproportionate to any local or general disease that can be detected, and the cause for which we believe to be mental, should properly be diagnosticated hysterical, if the conventional meaning of the word is accepted. The symptoms presented in this condition are almost unlimited in number, being equalled only by the powers of imagination, and are divided into sensory and motor.

The sensory symptoms are anæsthesia, analgesia, hyperæsthesia, paræsthesia, and neuralgia, with the special sensory disturbances anosmia, hyperosmia, and parosmia.

The motor symptoms are hyperkinesis, paresis, akinesis, and chorea, or want of co-ordinated movements.

The second or neurasthenic class of cases differs from the first in that the condition is ordinarily associated with depression of the physical and mental powers, and the patient is usually, though not always, anæmic, and appears in a state of apathy which is rare in hysteria.

Since neurasthenia and spinal irritation are by the majority of authors considered synonymous terms, and as the symptoms are often described as the same as those of hysteria, perhaps the word will not carry the significance I intend it should, unless it is stated that under it I would include all those nervous affections, functional in character, of the throat and nose which occur without other obvious cause in persons who would be placed in what Rosenthal calls the depressed form of spinal irritation (neurasthenia).

These people are what is called "run down," and the nervous system alone may be affected or in association with an exhaustion of all the vital functions. The mucous membrane of the upper respiratory passage is frequently seen to be anæmic, and relaxed throat is common. The disease is gradually progressive, the symptoms are constant, not intermitting as in hysteria, and paresis, akinesis, and anæsthesia more often occur than hyperkinesis and hyperæsthesia.

Anæsthesia of the epiglottis has been stated to be pathognomonic of hysteria, and Hammond says that Chairou, in *Études cliniques sur Hystérie*, has shown that in all cases of hysteria the reflex excitability of the larynx is abolished, and that he, Hammond, "has in every case verified Chairou's statement." My own experience does not coincide with these observations, for I have frequently seen marked hyperæsthesia of the larynx in hysteria, but in almost if not quite all of the cases I would call neurasthenic I have noticed a diminution of sensation in the throat. The neurasthenic cases differ materially from the hysterical, and the two ought to be considered as nosologically distinct. In the one there is a depression of the cerebro-spinal nervous system frequently associated with a lowering of the general physical condition, and in the other the state of the general health may be good, and the nervous system exalted as far as its general functions are concerned, only showing some local disturbance which is due to a morbid psychical state, but without perversion of the ordinary mental functions. Relief will not be obtained in one case by treatment which would be most effective in the other; therefore when a patient who has a functional nervous disorder of the throat applies for treatment, even though it be a young woman who has some menstrual irregularity, the question must be considered whether the symptoms are due to an abnormal mental influence or to nervous asthenia before it is classed as hysterical or neurasthenic, and before it is decided whether it will most probably be benefited by treatment which will have an effect on the mental and moral tone, or whether good hygienics, tonics, and nervines will be most potent for the relief of the condition. That hysteria sometimes occurs in persons who are suffering from nervous exhaustion goes without saying, but the application of the term hysterical to all functional nervous affections of the throat occurring in subjects of neurasthenia can hardly be considered satisfactory.

Miss S., of West Virginia, represents fairly well this class. She was the eldest daughter of a widower, and on her devolved the duties of housekeeping and supervision of the family. The many cares incident to these duties she undertook when about eighteen years of age, but after three or four years her health was noticed to be failing, and later on she lost her voice, so that she could not speak aloud. She was brought to the city to be under my care, and on examination it was seen that she had relaxed throat with paresis of the vocal cords. On attempted phonation, there was but slight approximation of the cords, and only a feeble whisper was produced. She was treated for one month with iron and other tonics and nervines, and the local application to the throat of solution of ferri perchlor. and galvanism externally and internally. Before she returned home she had improved greatly in general health, and had regained her voice absolutely.

The two points which are quite distinctive of this case are that the loss of voice was gradual for some months, *pari passu* with the failing of her general health, and, after being unable to speak aloud for several months, when treatment was adopted for the improvement of her condition, none of the measures used at any time suddenly restored the natural tone of the voice as occurs in hysteria, but in the course of the month she was under treatment, it became stronger by degrees until finally the normal tone was regained. She returned to her home in Nov. 1882, with directions to continue the use of the same line of remedies that have been indicated, and two years afterwards I learned that she had retained the voice and had no trouble with her throat, which I have no doubt is her present condition, as I have heard nothing to the contrary.

The third class is called the "Reflex Irritative," though perhaps better names might be given to these different varieties of cases. Here the throat affection is dependent on an excitation or injury to either the cerebro-spinal or sympathetic nervous system.

The symptoms presented are cough, spasm, or paralysis. The treatment of this form differs from the others in that in the hysterical neuroses it should be directed to the mind, in the neurasthenic to the nervous system, and in these cases all the remedial measures must be directed towards that part of the human economy in which the source of irritation is found to arise. For many years the laity have been familiar with the term "stomach cough," which in some instances is correctly named, but more recently laryngologists have given considerable attention to this subject, and have shown that many neuroses of the throat originate in irritation in the ear, the nose, the stomach and bowels, the genito-urinary apparatus, as well as from intra-thoracic disease of the heart or pericardium, the aorta or subclavian artery, the lungs or pleura, and from mediastinal tumors, also from goitre and enlarged bronchial glands, and during the past year Gouguenheim and Leval-Picquechef have demonstrated that some of the neuroses of the larynx, about the etiology of which there has been much uncertainty, are due to disease of a little chain of lymphatic ganglia situated along the trachea from the larynx to the bifurcation. In the report which they make, the following sentences occur.

> "The study of this part of the lymphatic system is interesting then, not only for the anatomist but also for the clinician, because these ganglia may play a grand rôle in the functional troubles of the larynx, vocal or respiratory. They become hypertrophied in a number of cases, and, however little excessive the development may be, the recurrent nerves, to which they are very proximate, are compressed by them, and this compression gives the key to frequent functional troubles which are far from being proportionate to the laryngeal lesions. One of us has already observed in this region the fact of the compression of the two recurrent nerves by the greatly hypertrophied and degenerated lymphatic ganglia, and the compression has enabled us to explain very grave respiratory troubles which had necessitated tracheotomy."

Among the conclusions of the paper we find that

> "The description of these ganglia was based on twenty dissections in normal and pathological conditions. These ganglia form a chain composed nearly always of three groups. The *inferior*, the most constant and voluminous, is almost continuous with the mediastinal ganglia; the *middle* is less constant than the inferior, and is composed of extremely small ganglia which are often lost to view; the *superior* group is situated at the posterior and inferior portion of the larynx. It is perhaps less constant than the middle, and is also composed of extremely small ganglia. The ganglia are susceptible of becoming hypertrophied and of attaining a considerable size in tuberculosis, in cancer, and perhaps also in syphilis.
>
> "The autopsies made were principally in tuberculosis, rarely in cancer, and never in syphilis.
>
> "The hypertrophy was most marked of the inferior and superior groups. The symptoms of compression of the nerve are either paralysis or spasm."

The value of these investigations seems to me to be very great, especially in pointing out the probable explanation of the dry, irritative spasmodic cough and occasional loss of voice which frequently precede, by some months or even years, any evidence of phthisis pulmonalis that can be detected by physical methods of examination and under these circumstances, or, if the lungs ever become affected secondarily to the throat disease, as I am disposed to believe from a clinical observation and treatment of not less than 5000 cases of phthisis during eleven years' special practice in throat and chest diseases, then, the early diagnosis of tuberculous deposit in the peri-tracheo-laryngeal glands should be of very great importance in the prophylaxis of phthisis pulmonalis.

Begbie states that Dr. Graves, of Dublin, directed attention to the frequency with which various nervous affections are due to reflected nervous irritation, and that "he graphically describes the sudden and complete relief afforded to a young lady who had suffered most severely from spasmodic cough, after the discharge of a tapeworm, which had been effected by a large dose of oil of turpentine and castor oil."

In the same article, speaking of spasm of the pharynx and œsophagus, Begbie says: "It is of common occurrence, particularly in females, in whom it shows itself either as a reflex phenomenon dependent on uterine irritation, or—and this still more frequently—as one of the most striking features in a paroxysm of hysteria."

A distinction is here made between a reflex throat neurosis produced by uterine irritation and an hysterical neurosis. This I have before alluded to, but it is a differential diagnosis rarely made by the profession, for generally when the uterine disorder has been discovered the functional trouble is classified as hysterical. Another interesting reflex neurosis is where there is bilateral paralysis of the adductors from pressure on the recurrent of one side, which Flint states Dr. Geo. Johnson called attention to in 1875, and of the correctness of whose observation he (Flint) had an example in a case where there was an aneurism of the descending portion of the arch of the aorta pressing on the left recurrent laryngeal nerve, in which both lateral adductors of the vocal cords were paralyzed.

In fact, instances of these reflex neuroses, as well as of the hysterical and neurasthenic, could be given in great number and many of them might prove interesting; the scope of this article is not intended, however, to be exhaustive or didactic, but merely suggestive, and enough has been said to present the subject for consideration; the writer will, therefore, close with the statement that he has no doubt that it could have been made more interesting, but that in it he has presented data from the experience of others as well as his own with especial reference to defining more clearly, for diagnosis and successful treatment, the different forms of functional neuroses of the throat and nose.

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ARTICLE X.

HISTORY OF A CASE OF TWICE-PERFORMED CÆSAREAN SECTION, UNDER THE LATE PROF. WILLIAM GIBSON; WITH AN AUTOPSY OF THE PATIENT MADE FIFTY YEARS AFTER THE FIRST OPERATION, BY DRS. CALEB W. HORNOR and ROBERT P. HARRIS, of Philadelphia. Reported by ROBERT P. HARRIS, M.D.

IN August, 1835, there appeared in this JOURNAL a report by the late Dr. Joseph G. Nancrede, of a Cæsarean operation performed with success to mother and child, on March 25th of that year, by Prof. Gibson, of the Chair of Surgery in the University of Pennsylvania. As this was the first operation of the kind in Philadelphia, its successful termination made the case the town-talk among physicians, and very naturally also among the matrons of the city, which then contained less than one-fourth of its present population.

Again, in this JOURNAL for May, 1838, there appeared a second report of a similar character, written by the late Dr. George Fox, concerning the same operator, and the same patient, showing that she had been again delivered with full success under the knife, on November 5, 1837. These two operations saved a daughter and son, who were, in their early childhood, shown annually to the medical class of students in the University of Pennsylvania by the late Prof. Hugh L. Hodge, when he lectured upon "Gastro-Hysterotomy;" and many now living will remember the mother and her attractive little ones, and how they estimated her bravery in submitting (for there were no anæsthetics in those days) to this painful operation for the saving of her children. Not only did these children live to maturity, but the first is still living, the son having died of consumption on October 4, 1881, when nearly 44 years old.

The patient, Mrs. Reybold, died on August 15th, 1885, aged 76 years and five months. She had been declining in strength for a few years, and died from the failure of her digestive functions, her mind being clear until the last. She has thus outlived the nine physicians who were present at her first operation, and the four who, with the two Gibsons, made up the corps at the second, all of whom, with the exception of the operator, graduated in the University of Pennsylvania from 1806 to 1836. Among those present we will mention Prof. William P. Dewees, Prof. William E. Hornor, Prof. Charles D. Meigs, Prof. Hugh L. Hodge, Dr. George W. Norris, and Dr. John Dove, of Richmond, Virginia.

Mary H. was born in Ireland on March 15, 1809; came to America in early childhood, and became Mrs. Reybold on May 16, 1830, at the age of 21; and a patient of Dr. George Fox in June, 1831, when fully matured in pregnancy. It was then discovered that her skeleton bore unmistakable marks of rachitic disease, and that her pelvis had been much deformed thereby. This was attributed to a fall in her second year, after which she was not able to walk for two years or more, but finally regained her health. Finding the difficulty in her case, Dr. Fox called to his aid Prof. James, Dr. Thomas T. Hewson, Dr. J. Rhea Barton, Dr. Chas. D. Meigs, and Dr. Lukens. The consultants decided "that the antero-posterior diameter" of the superior strait "was certainly not more than two inches, and *probably not more than one and three-quarters.*" The Cæsarean operation was proposed, but was decidedly opposed by "some of the most distinguished surgeons" present, under a conviction that it would be almost necessarily fatal to the mother. After a labor of sixty-four hours, and the fœtus being already dead, Dr. Meigs perforated its head, but was not able to deliver it with any of the appliances then in use. He was forced to delay until putrefaction had softened the fœtus before he could remove it, which was not until thirty-three hours later. By this time Mrs. R. was much exhausted and narrowly escaped death. It was the opinion of those present during the delivery, that the Cæsarean operation would have been better and attended with no more if as much risk. Dr. Fox was called to the labor on June 14th, and it was not completed until the night of June 17–18th. At the next morning visit her pulse was 112, and the following, 94. After this she made a good recovery.

Before her next labor, Dr. Meigs had invented his "embryulcia forceps," and as she would not consent to the bringing on of premature labor, or submit to the Cæsarean operation, he was forced to destroy the fœtus, and reduce the size of its head, which the instruments enabled him to do so readily that delivery was accomplished in two hours. This took place on June 23, 1833, and the delivery was commenced early, as Drs. Fox and Meigs believed that upon the previous occasion Mrs. R. had narrowly escaped death by exhaustion. Dr. Fox was again the accoucheur, and Dr. Meigs the consultant in the case. The illustration in Prof. Meigs's work upon Midwifery, in which he shows the use of his bent forceps in this case, is incorrect as to the direction of the spine and sacrum, as will be shown hereafter. He has made the pelvic collapse anterior, when it was posterior, at the sacro-vertebral angle, of which he was perfectly aware, as he says she had a deep hollow at the base of the sacrum. Dr. Meigs told Mrs. R. that he would not destroy another child for her in the event of her becoming pregnant, and that she would have to submit to the Cæsarean section.

In September, 1834, when three months pregnant, Mrs. R. placed herself under the care of the late Dr. Joseph G. Nancrede, who called in the counsel of the late Dr. Francis S. Beattie, and it was finally determined to deliver by the Cæsarean section, under Dr. Gibson, who, with several others, was consulted about the case. When in labor, on March 25, 1835, it required two hours' waiting and urging, with the aid of her father confessor, before she would consent to submit to the operation. Dr. Gibson and party were then called up, and the operation performed after a labor of twelve hours. With regard to this operation, we have only to say that the abdominal incision was six inches long, that the membranes were unruptured, and that the fœtus presented by the breech. The waters were discharged through the wound, and the uterus was allowed to depend for safety upon its own contractions. The operation lasted about ten minutes, and the patient's pulse was 80 after a short rest.

On the 29th there were evidences of a moderate peritonitis; pulse 110; no tympanites, but tenderness on pressure low down in the abdomen, and pains in the iliac regions. This pulse of 112 continued for four days, during which time she was bled f℥viij on two occasions, and forty leeches were applied (probably American, counting f℥j to six or eight); she was likewise purged on the 31st. Her pulse now very gradually fell to 84, which it reached at the end of the third week; she sat up in twenty-eight days, a small sinus still remaining in the abdominal wound, which was perfectly cicatrized by June 1st. These points have an important connection with what we found on autopsy.

During the fourth pregnancy of Mrs. R. the services of Dr. Fox were again called in requisition, it being understood that she would submit to a second Cæsarean operation if required, and she was placed upon a milk and farinaceous diet in preparation. When summoned to attend her in labor, she was found excited, with a pulse of 116, and not in as favorable a condition as upon the preceding occasion. Her abdomen showed a cicatrix of five inches in length, which was hard, dark-colored, and puckered; the uterus was anteverted, and "adhesion had apparently united the integuments and uterus for a space of four or five inches from near the pubes up towards the umbilicus." The child was ascertained by the ear to be alive. The section was made on November 5, 1837.

Prof. Gibson was again the operator, and was assisted by Drs. Fox, Norris, and Meigs. He cut directly in the line of the old cicatrix, "from an inch and a half below the umbilicus nearly down to the pubes." "The uterus was found connected with the integuments by strong adhesions, for a space of about four inches; the incision into this organ was made near the fundus, and extended down five or six inches; that portion that was adherent was much attenuated, being scarcely one-fourth of an inch in thickness." The operator dissected up the adhesions until a knuckle of intestine protruded, when he computed the union at half an inch in width. The placenta was immediately under the line of incision, and the delivery gave rise at first to considerable hemorrhage. The boy extracted was of full size, but very feeble, and his respiration was for some time quite imperfect. The abdominal wound was closed by six sutures, adhesive strips, a compress and binder. Time in labor 10 hours; pulse before operation 112, and immediately afterward 96.

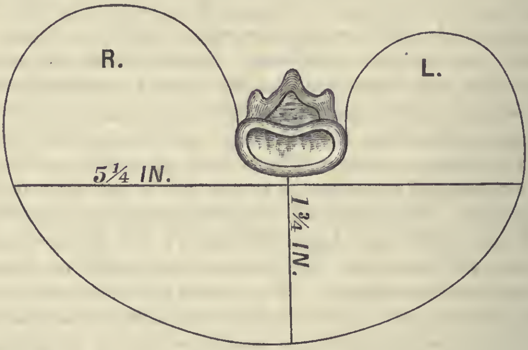
Mrs. R. made a good recovery after the second operation, and had a pulse of 84 in twelve days; there were no symptoms of peritonitis. She was able to nurse her infant, and sat up in twenty days; the wound entirely closed by February 10, 1838, there having remained a fistula, as after the former operation.

The reporter became acquainted with Mrs. Reybold on April 1, 1878, and believing that all who had written about her were in error as to her height, had her carefully measured by her physician, the late Dr. William F. Patterson, who ascertained that she was not 4 ft. 6, but 4 ft. 8 inches in height. She said that the second operation through the old scar was particularly severe, that this spot was always sensitive, and that she felt a drawing sensation in it. She was unusually straight in her dorsal spine and neck; sat very erect without support, and bore no evidence of any deformity when dressed; she walked slowly, and did not lift her feet well. When Dr. Fox was asked to attend her in her first labor she was 22 years old, and he a graduate of three years' standing; he had no suspicion of her conformation until he saw her actually in labor some weeks later. She promised on one occasion to leave him her pelvis, but being her senior he did not live to get it. He died on Dec. 27, 1882, aged 76, and, if we are not in error, was the last survivor of the thirteen doctors who were present at the first and second operations collectively. Little did the nine physicians and surgeons at the first operation dream of the possibility of the small patient under the knife outliving them all. She was always under the opinion that Dr. Nancrede starved her, which he was forced to do; and was particularly grateful to Dr. Fox, who from her condition was able to feed her more generously after the second operation.

Autopsy.—Several years ago Mrs. R., by removing to the mansion of her daughter, came directly under the care of Dr. Hornor, and we agreed, in the event of her death in our time, to ask for and make an autopsy with special reference to her pelvic deformity and the attachment of the uterus. In a few hours after her death, two days ago, Dr. Hornor was kind enough to call upon me, and the remains being brought to the city we proceded to the examination in the evening, ten hours after her death. We found in the humeri femora and tibiæ very decided evidences of rickets; the arms being partly bent, the ossa femora curved antero-laterally, and the tibiæ flattened and curved forward. The upper parts of the thighs were very prominent at the sides of the pelvis, and the sacrum made quite an angle with the lumbar vertebræ, which were marked by a deep depression. There was no unusual prominence in the mons veneris, which was long, wide, and adipose. The abdomen was full and prominent from flatulent distension of the small and large intestines; the cicatrix made by the operations was well marked, but was not puckered or drawn in as if under any tension from within. We opened the abdomen by an inverted ⊥ incision, carrying the vertical cut to the left of the umbilicus and to the ribs, so as to avoid the cicatrix and any uterine adhesion that might exist. We found very decided evidences of the attack of peritonitis that followed the first operation, in the form of strong bands uniting the omentum to the abdominal wall, and the latter to the large intestine, one fan-like attachment to the angle formed by the ascending and transverse colon being particularly conspicuous. We also noticed the evidence that the incision had been carried to within half an inch of the pubes, in the formation of a dense cicatricial band in the seat of the linea alba, which was covered by skin showing but little evidence of having been incised. Four of the cicatrices made by the sutures were very conspicuous, being long and depressed; three inches apart in vertical measurement, and four and a half inches across the abdomen. Under the upper part of the abdominal cicatrix was a long band of tissue of a pale red color, having an intimate attachment to the same for about two inches in length, and extending on either side for about one inch in entire width. This band was entirely free below and passed down into the pelvis. It was soft, flat, smooth, and very much of the form of the tongue of a small dog. Upon carefully tracing this we found it to be the fundus uteri elongated to 4½ inches. The ovary on either side was at the brim of the pelvis, and these organs were small, dense, white, long-oviform, and about the size of a large pea-nut kernel. The upper part of the vagina and the cervix, after a half century of tension, felt like a hard cord of the size of the index finger. Union must have taken place from adhesive peritonitis between the fundus uteri and the upper part of the abdominal wound, soon after the completion of the first operation, before the uterus had fairly advanced in involution, and have become so dense in character by the subsequent attack as to prevent the organ from ever regaining its normal size and form, although it did not prevent a second impregnation. As Mrs.

R. ceased to bear children at the age of 28, although she menstruated, it is possible that this strain upon the uterus may have had something to do with her remaining unimpregnated.

The deformity of the pelvis was very much such as we expected to find it, except that the true conjugate was the smaller of the two measures given at the first consultation called by Dr. Fox in 1831, viz., 1¾ inches. The sacro-vertebral angle was very prominent, and the curve made by the two pubic bones in the linea-ileo-pectinea wider than normal. The pelvic brim in front was represented by a wide arch, and the whole edge of the brim of the true pelvis was very smooth and round without any inequalities. The transverse diameter carefully taken measured 5¼ inches. A measure carried in perpendicularly so as to avoid the promontory of the sacrum showed that this bone had a very deep concavity, which must have favored the use of instruments and the hand in extraction. My hand with the thumb and fingers extended and drawn together could be passed downward through the superior strait on the right side of the sacral projection but not on the left, which was of the same form but decidedly more contracted. This difference of development somewhat affected the whole of the left lower extremity, which was weaker and rather more ill-shapen than the right. The first fœtus of all, which was removed after putrefactive softening, was probably extracted through the right passage, although on the other side there was as much space as existed in some well-known cases where the same measure was adopted, as for example that of Elizabeth Sherwood, delivered by Dr. William Osborn, of England, after a labor of 72 hours, requiring 3 hours' traction; the woman recovered.



The superior strait of Mrs. Reybold's pelvis marks it as one of the "*reniform*" variety, but it differs from many of this type in the fact that the sacral indentation is much more decided, the circumference of the brim longer, and the side passages more round and larger. To deliver a fœtus through such a pelvis in two hours, more than half a century ago, was a decided feat on the part of Prof. Meigs, and it is equally creditable to him that he refused to repeat the operation; for the next presentation proving to be one of the breech, the destruction and decapitation of the fœtus would probably have been fatal to the mother before the head could have been extracted. Who that has seen this woman with her grandchildren and great-grandchildren could have condemned Dr. Meigs and those associated with him when they decided against craniotomy and in favor of gastro-hysterotomy?

The case of Mrs. Reybold is not simply a curiosity of surgical experience. That she twice recovered is not so remarkable, when we consider that five other women in the United States have done the same thing, and that one of these has now a daughter and son, living with her in Toledo, Ohio, all three being in good health, and with quite as fair a prospect of long life as she had. This Toledo mother is 39 years old, her daughter 10, and son 5 years. The danger in these cases is mainly after the first operation, except in those where the mother has fallen into bad health, as occurred in two instances in the United States. A third woman died after a third operation, from the same cause. The lesson to be learned from these recoveries under the first operation, and from others that have been operated upon once only, and with full success, is that it is all-important to give relief to the patient as early as possible. Mrs. R., by reason of her own opposition, lost more than two precious hours before the first operation, and made a very narrow escape from death by peritonitis. She was exceedingly fortunate in being under the care of Dr. Nancrede, who had had an experience of twenty-two years, lived in the heart of the city, and was a leading accoucheur. It was through his determination, after a careful investigation of the subject, and Dr. Gibson's willingness to operate, that the work was finally done. The celebrated surgeon, Philip S. Physick, had been offered the honor in a former pregnancy, but declined, fearing a fatal result. Dr. George Fox would have operated on the second occasion, but being still young in the profession, feared the expression of public opinion, in the event of a failure to save the patient, after the former success under another. This I was told by his nephew more than forty years ago.

In looking over the eight cases upon which the Cæsarean operation was performed twice, and in one instance three times, I find that promptness in action was a noted feature in the cases where the fœtus was saved. Thus the two Scudday operations were after 12 hours, and "a few hours." The Mills operation on a dwarf of 3 feet 9 was after a labor of only 4½ hours; the Newton case after 6 or 8 hours, and the Toledo operations after 7 hours and 3 hours respectively. The Merinar second operation was also "early;" the baby perished in the first labor. Had the first Gibson operation been several hours earlier, the patient might have made a much more rapid recovery. The Toledo operations were the only ones of the seventeen in which the uterine wound was sutured, the other fifteen dating prior to 1867, when this manner of treatment was revived with success in New Haven by Dr. T. Beers Townsend, and in New Orleans under Drs. D'Aquin and Brickell.

With the great advantages we have now over what existed in the days of Dr. Gibson, we ought to be able to save a larger instead of a less proportion of cases but for the fact that rachitic women are generally poor, and do not put their cases in the hands of Nancredes or Foxes in education and medical training.

REFERENCES.—North American Medical and Surgical Journal, Oct. 1831, p. 484. Meigs's Philadelphia Practice of Midwifery, p. 322. AMERICAN JOURN. OF THE MED. SCIENCES, vol. xvi. 1835, p. 343, and vol. xxii. 1838, p. 13. Gibson's Surgery, 4th edition, vol. ii. p. 405.

ARTICLE XI.

INFLAMMATION OF THE ATTIC OF THE TYMPANUM.[1]

By SAMUEL SEXTON, M.D., Aural Surgeon, New York Eye and Ear Infirmary.

INFLAMMATION of the middle ear is subject to certain limitations due to its anatomical construction, especially of its osseous boundaries, and that arising in the attic is, owing to its sequestration, usually of much more significance than the form which begins in the atrium. This form of disease has not, it is believed, hitherto received the attention its importance demands; indeed, in its early stage, it is likely to escape observation altogether if examination of the ear be limited, as it very often is, to an inspection of the membrana tympani only, since this membrane may not at any stage of inflammation of the attic be greatly or at all affected.

Inflammation of the *atticus tympanicus* may be considered under two forms—acute and chronic. The latter having attracted the attention of writers before the former, I shall first review what has been written about it before considering the acute form.

Chronic inflammation of the attic presents itself frequently in the form of a deep sinus, containing, sometimes, either pultaceous matter or inspissated pus, sometimes polypoid tissue or epithelial crusts, leading through the membrana flaccida or inner extremity of the external auditory canal up into the attic—and frequently from thence into the antrum. Sometimes the membrana flaccida and ossiculæ are missing in these cases, and we find that the margo tympanicus of the auditory plate is covered by cicatricial or granulation tissue, and that a large cavity extends beyond, which may be explored with a bent probe. Again, in other cases, the membrana flaccida remains, together with the incus and malleus, and even a portion of the membrana tympani; these, from thickening of the tissues, may obstruct drainage from the attic by narrowing the outlet from above. Any of these chronic processes may last for many years; I have seen such pathological tracts or cavities in very old people, a result of acute inflammation of the attic in early life. Troeltsch, who observed these sinuses twenty-five years ago, believed that they were due to perforation of the roof of the external auditory canal in cases where the cellules sometimes extending over this region were the seat of disease. That their origin may be thus explained in some cases I have no doubt, but more frequently they depend on perforation of the membrana flaccida. Subsequently this condition of things attracted the attention of others; several cases came under the observation of Dr. J. O. Green, who, under the head of "An unusual variety of purulent inflammation of the tympanum," described them in the *Boston Medical and Surgical Journal*, March 6, 1874. He regarded the trouble as beginning with a catarrhal inflammation, which afterwards became purulent, and to a greater or less extent involved the entire tympanum—"but the mucus secreted among the ligaments and other structures in the upper part of the tympanum is unable to gravitate to the floor of the cavity on account of its confined position." Both Drs. C. H. Burnett and C. J. Blake reported cases at the meeting of the American Otological Society in 1874. Subsequently the latter drew attention to acute invasions of the upper part of the tympanum (*American Journal of Otology*, April, 1882), observing that the tympanum becomes inflamed during the first few hours, at the furthest in twenty-four hours, and that when the membrana tympani was opened it gave vent to a copious serous discharge. He seems scarcely to have considered the affection as arising altogether independently of the atrium of the tympanum, a view also seemingly accepted by Buck, who states in his book on the ear that purulent matter escapes through the membrana flaccida in acute purulent inflammation of the tympanum, because less resistance is offered in that locality.

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[1] Read before the American Otological Society, July 14, 1885.

Before considering the acute form of inflammation of the attic, as observed by myself, and for some years demonstrated to my students at the New York Eye and Ear Infirmary, I beg to allude briefly to some points concerning the anatomy of that portion of the ear under discussion, which, for the most part, lies immediately beneath a wide triangular plate of bone on the anterior surface of the petrosa, known as the tegmen, consisting of the attic, antrum, a varying number of cellules, and the Eustachian tube.

> "The *attic*[1] of the tympanum is a pyramidal recess over the atrium, and above the tympanic orifice of the external auditory meatus. Its upper anterior boundary is the tegmen, which separates it from the cranial cavity, and is mostly provided with a layer of spongy substance of variable thickness. Its inner boundary is a convex prominence (Fig. 1, *e;* Fig 2, *b*), produced by the contiguous portions of the external semicircular and facial canals. Its outer boundary is the wide crescentic tympanic scute (Fig. 1, *b;* Fig. 2, *c*) of the auditory plate. It opens above the prominence of its inner boundary, outward and backward, by a large aperture[2] into the mastoid antrum.

[1] "Atticus tympanicus, upper chamber of the tympanum of Huxley."

[2] "Petro-mastoid canal of Sappey."

Fig. 1.

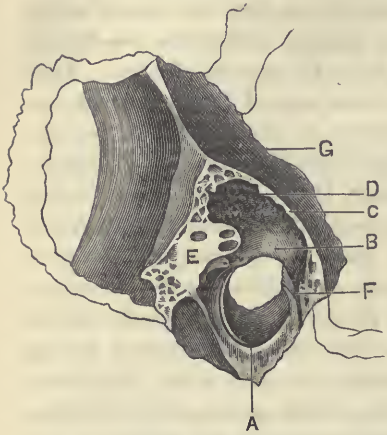

Fig. 2.

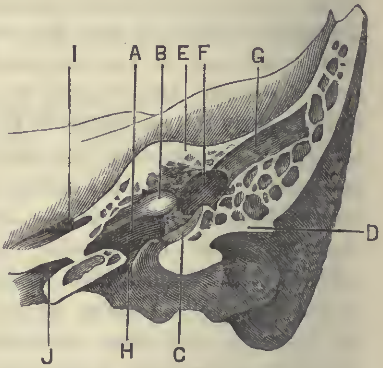

Fig. 1 (Leidy).—View from within of the outer portion of the left temporal bone, sawed through the tympanum, fore and aft, parallel with its inclination. *A*, tympanic margin of the external auditory meatus, formed below and at the sides by the grooved margin of the tympanic plate, and above by the margin of the auditory plate; *B*, scute, forming the outer boundary of the attic; *C*, tegmen; *D*, mastoid antrum; *E*, prominence of the inner posterior boundary of the attic; *F*, canal for the accommodation of the long process of the mallet; *G*, petro-squamosal fissure. Below *E* are seen the pyramid and the aperture of the tympanic cord.

Fig. 2 (Leidy).—Section of the left temporal bone through the squamosa, immediately in advance of the external auditory meatus. *A*, atrium of the tympanum; *B*, prominence on the inner back part of the attic; *C*, scute at the outer part of the attic; *D*, auditory plate; *E*, tegmen; *F*, mastoid antrum; *G*, anterior passage of the same; *H*, canal for the long process of the mallet; *I*, hiatus of the facial canal; *J*, Eustachian tube.

"Beneath, it opens into the atrium by an elliptical aperture, formed internally by the ridge of the facial canal, and externally by the tympanic margin of the auditory plate. . . .

"The *mastoid antrum* (Fig. 1, *d;* Fig. 2, *f*) is a prolongation of the attic backward and outward in the spongy substance of the mastoidea. It is of variable size, ordinarily ranging from that of the attic to double the dimensions of this. It sometimes ends in a blunt, flask-like recess, but is oftener more or less extended downward among the cellules of the mastoid process. Frequently it gives off a smaller fork or passage (Fig. 2, *g*), which is directed outward and upward among the cellules above the external auditory meatus; and rarely a third branch is directed more anteriorly. While the atrium of the tympanum varies but little in size, the attic and mastoid antrum vary greatly."[1]

If now we carefully remove the *tegmen* in the recent subject, and look down upon the parts thus exposed to view, we shall find the attic and antrum *in situ*, and everywhere lined with mucous membrane. The attic is divided by the incus and malleus, which are placed across it fore and aft, into an outer and inner apartment; they only partially occupy it, and the long process of the former and the handle of the latter project down into the *atrium*. The two attic apartments, of which the inner is much the larger, communicate freely with each other overhead, with the atrium below, the Eustachian tube in front, and the antrum behind. The outer apartment is wedge-shaped, wider above and gradually becoming narrower below, where the body of the anvil and neck of the mallet lie almost in contact with the margin of the auditory plate. The bottom communicates anteriorly and posteriorly with the atrium by a very narrow slit.

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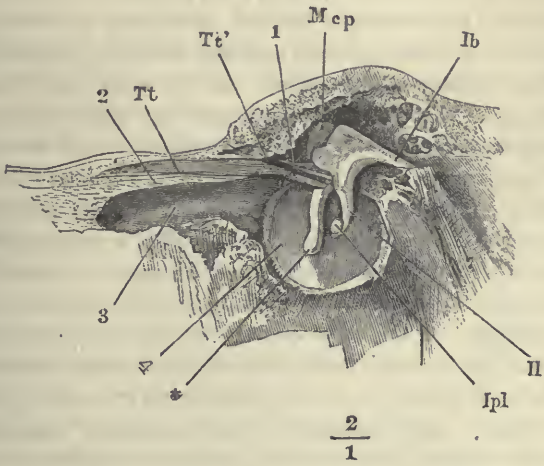
[1] The anatomical description above is from Leidy, *Science*, May and June, 1883.

Fig. 3.



View from within of the right tympanum and contiguous parts. From Henle. *Tt*, *Tt'*, tensor tympani; *Mcp*, head of the hammer; * handle of the same; *Ib*, short, *Il*, long process; *Ipl*, lenticular process of the incus; *I*, chorda tympani; 2, septem tubæ; 3, tube; 4, drumhead.

The inner apartment communicates much more freely with the atrium, but the passage is contracted by the prominence before alluded to on its inner wall, the impingement of the anvil and mallet, and the cord, ligaments, and folds of mucous membrane. (See Fig. 3.)

Acute Inflammation of the Atticus Tympanicus.—This may occur from catarrh of the head, due to exposure or consecutive to the exanthemata, and to the entrance of fluids propelled along the Eustachian tube in bathing or from the use of the nasal douche. It happens very often that the attic only is affected from these causes. This can readily be understood when it is kept in mind that the tympanic orifice of the Eustachian tube opens by a free sweep into the attic as well as into the atrium, and that fluids traversing the canal with considerable momentum would follow the upward sweep of the tympanic embrasure rather than gravitate downward. Moreover, the presence of irritating fluids seems to be much better borne in the lower than in the upper part of the tympanum. Inflammation of the attic may develop consecutively to inflammation of the atrium, and, of course, both may be affected simultaneously.

Inflammation of the attic is a much more serious affair than that of the atrium alone, because of the swelling of the mucous membrane which closes up the outlets and thus prevents drainage.

Inflammation of the attic is usually ushered in by more or less pain. As the disease advances the outlets are more or less closed, and the escape of secretions is thus interfered with. It will generally be found on examining the ear that the membrana flaccida is red, the vascular turgescence extending above on to the external auditory canal, and perhaps downward about the short process of the mallet. In favorable cases the regressive stage may begin at this time, but frequently the inflammation which was thus extended from the bottom of the outer apartment of the attic beneath the margo tympanicus of the auditory plate is attended with effusion of serum or blood; this raises up the membrana flaccida and the adjacent integument of the external auditory canal, which is quite loosely attached to the outer surface of the auditory plate. In some instances the bulging out of these parts is sufficient to form a sac which entirely conceals the membrana tympani, or may even entirely fill the canal and present at the lumen as a purplish tumor. It would seem that in some instances rupture of bloodvessels belonging to the tympanic plexus takes place, giving rise to the sudden extravasation of a large amount of sanguineous fluid. The tumor thus formed does not always communicate with the attic at first, although later on it may do so.

In a certain number of cases of inflammation of the attic, drainage continues through a small perforation in the membrana flaccida, a nipple-like outlet forming which may easily be mistaken for a polypoid growth; indeed, a polypus may subsequently develop from the mucous membrane presenting at this opening.

In a certain number of cases periostitis is present in a marked degree, affecting the neighboring parts; where it extends outwardly, the canal is red and glazed in appearance, but not so much swollen as in the cases above described. The periostitis is liable to spread itself outwardly over the auditory process, and thence along the surface of the mastoid or squamous surfaces of the temporal bone.

Inflammation may also extend downward into the atrium, producing characteristic symptoms in this part of the tympanum.

As long as the membrana tympani and the atrium are unaffected there is comparatively but little deafness, although autophonia may be present.

In nearly all of these cases the inflammatory process in some degree extends inward and backward along the petro-mastoid canal into the antrum; it may advance thence into the mastoid cellules or those lying above the external auditory canal or in the tegmen. When the escape of secretions into the atrium or Eustachian tube is prevented, the case is usually much more severe. It is in these cases that extension to the cranial cavity is most likely to occur. In children the imperfect closure of the petro-squamosal suture affords a much more easy invasion of the cranial cavity, and in adults even this often is a weak point. The antrum may remain in a diseased state after all tympanic trouble has abated, and both the membrana flaccida and membrana tympani have closed, drainage taking place through the Eustachian tube, or by means of a sinus out through the cortex of the mastoid.

The gravity of the case must be determined by the pain experienced and the appearance of the organ—symptoms not always sufficient to establish a differential diagnosis. Pain is often absent where the attic and antrum are affected, whilst in periostitis externa it is frequently severe; its presence, therefore, may in many instances be regarded as rather a question of temperament, at least as regards the tolerance of suffering, than as indicating the extent of the disease. Moreover, it is difficult to distinguish between the pains of middle-ear disease and those of pachymeningitis. As regards the physical signs, when the membrana flaccida and inner superior wall of the canal are red and angry in appearance, whilst there is tenderness over the mastoid or at the attachment of the auricle, we may conclude that the disease is most likely to expend its force externally; if pus makes its appearance early at the membrana flaccida, there is less probability of extension inwards. In young children, or in subjects of ozæna, periostitis externa is liable to be succeeded by caries of the temporal bone which may extend itself down into the antrum. The purulent matter escaping from the attic through the membrana flaccida or from a mastoid sinus in cases of ozæna is characteristic of this disease.

A consideration now of the treatment of inflammation of the middle ear from the writer's point of view need not include the generally accepted methods, but only such as have not, perhaps, been so extensively tried by others. The more serious cases met with occur usually from neglect or maltreatment in persons run down from some cause, and fixed rules for guidance in such cases cannot be made. It is my practice to administer remedies reputed to control inflammatory and purulent action in all cases; relying upon minute doses of mercury in inflammation of mucous surfaces until purulency threatens, when the calx sulphurata is indicated. Pain and vascular excitement may be controlled by aconite, belladonna, pulsatilla, gelsemium, and other remedies. In certain cases much relief may be obtained, or even a cure may result, by removing secretions from the attic through the Eustachian tube, a successful case of which I reported in the *Lancet*, October 18, 1884.

Where the above means, together with the local treatment to be mentioned further on, have been resorted to early, I have never met with a fatal result, and grave symptoms have been much less frequently encountered than when local measures only were employed. In the local treatment where there is simply redness of the membrana flaccida, due to acute catarrhal inflammation, a regressive course is soon established in many cases and any local interference is inadvisable. Where there is periostitis of the canal, incisions often do harm, but where catarrh advances to the purulent stage, the symptoms may become more urgent and the employment of the knife demanded. Unless a sac containing sanguineous matter or pus has formed, and is connected by a sinus with the attic, it will be useless to cut down upon the inner end of the canal or the membrana flaccida, because the knife cannot be thrust through the auditory plate underneath. Vent to secretions in the attic may be assured in some cases by introducing the myringotome through the upper edge of the membrana tympani and behind the long process of the incus. The danger of wounding the chorda tympani nerve is considerable in this operation, and incurrence of the risk would only be justifiable when symptoms were urgent.

When purulent matter forms in periostitis externa, after Wilde's incision drainage can be maintained best by the employment of two or more thicknesses of catgut. This has the advantage of being easily introduced folded end foremost and is not so irritating as most dressings. Where a sinus enters the antrum or cellules, this dressing permits free drainage, and if the number of folds be gradually increased the opening may be enlarged to almost any desired extent. This seems to aid greatly in the disappearance of minute sequestra. The catgut should be changed as often as once or twice daily. I am indebted to Dr. Thomas M. Markoe for the suggestion of the surgical use of catgut.

Where inflammation has extended to the antrum, either from without in consequence of caries due to periostitis externa, or along the petromastoid canal from the tympanum, the surgical aspect of the case may become paramount. From my own experience an extension of the diseased process from the attic is a common occurrence and usually calls for no special interference. But in neglected and otherwise unfavorable cases drainage must be secured whether we have to deal with middle ear disease or any of its complications. Ineffectual operative procedures here needlessly torture the patient without accomplishing the end in view; an operation for the relief of pachymeningitis might thus be tantamount to trephining because of the pains of middle ear disease, a procedure which at best would not probably liberate the products of inflammation of the dura even if any were present. I cannot, therefore, from this point of view, regard trephining the mastoid as other than a means of drainage, not likely to affect the course of pachymeningitis or cerebral abscess.

There is, of course, a wide and honest difference of opinion in respect to the method of securing drainage in purulent middle ear disease, but the writer is constrained to believe that on the whole there is over-much energy manifested in accomplishing this object.

Observation continued since this question was last discussed before this society confirms the belief then held that we may often avail ourselves of the tendency manifested by the pent-up products of inflammation to escape through the posterior wall of the external auditory canal by perforating the posterior edge of the thin auditory plate just above where it joins the tympanic plate. This operation opens up immediate communication with the attic and petro-mastoid canal. In a large number of instances the same object is attained by perforating the membrana flaccida as previously recommended. Efforts must not be omitted in these cases to re-establish drainage from the attic down into the atrium, nor should it be forgotten that a communication with the Eustachian tube very frequently remains in these cases.

In the local treatment of chronic cases where sinuses remain, after the removal of polypi or other products, salicylic acid has, in my hands, been attended with the best results, bringing about a dry desquamative condition, which is often the best issue to be hoped for.

ARTICLE XII.

THE PNEUMONIA-COCCUS OF FRIEDLANDER (*Micrococcus Pasteuri*, Sternberg). SECOND PAPER. By GEORGE M. STERNBERG, M.D., Surgeon U. S. Army.

THE present brief paper becomes necessary, in order to correct an error which occurred with reference to the illustrations of my paper published in the preceding (July) number of this JOURNAL.

Unfortunately the writer was absent in Europe when this paper was published, and failed to receive the proof which was sent to him for correction. This failure has resulted in a grave error through which the amplification of Figs. 1, 2, 3, and 4 is 2500 diameters, while the descriptive text gives it as 1000 diameters. As stated in the last paragraph of the paper, the figures were drawn under the camera lucida with an amplification of 2500 diameters. They were to be reduced by photography to 1000 diameters. *But the reduction was inadvertently not made*, and the comparison of these figures with Fig. 6, in which the amplification is 1000 diameters, shows a very great difference in the dimensions of the oval micrococci from different sources, which might be taken as evidence of a specific difference, instead of specific identity as claimed, if it were not due to a mistake. Moreover, Figs. 5 and 6 are such faulty reproductions that they fail utterly to establish a morphological resemblance to Fig. 7, which is a very good copy of the figure which illustrates the paper of Salvioli. The cuts which have been prepared for the present paper are better, but a comparison of Fig. 5 with the photo-micrograph from which it is copied shows how difficult it is for the wood-engraver to reproduce faithfully a photograph from nature. Fig. 5 of the illustrations of my first paper is omitted from this one, and the reader is referred to the original work of Prof. Sée in which it is Fig. 2, of Plate I.

In claiming that the pneumonia-coccus of Friedlander is specifically identical with my *Micrococcus Pasteuri*, it must be understood that I use the word *species* in its botanical sense, and that I recognize different varieties—physiological or pathological varieties of more or less permanence—of the same species.

It may be well to recapitulate briefly the principal evidence which has led me to the conclusions stated.

a. My own observations and the figures given by Talamon and Salvioli have convinced me of the morphological identity of the oval micrococcus found in pneumonic exudate and my *M. Pasteuri*, as found in the blood of a rabbit killed by the injection of human saliva. The mode of grouping, in pairs, or in chains of three or four elements, and the occasional appearance of a mucinous envelope (capsule of Friedlander) which is developed by a special method of treatment (staining with iodine solution) complete the evidence of specific identity from a morphological point of view.

b. Injections of pneumonic exudate and of liquid cultures from the same, made by Talamon in France, and by Salvioli in Italy, into the pulmonary tissue of rabbits, have, in a majority of the cases reported, caused the death of the animal, and it is noted that the blood contains the oval micrococcus in abundance, also (by Salvioli) that the spleen is enlarged, and that an infectious disease is induced. The accounts given by both of these authors induce me to believe that this infectious disease induced by injecting pneumonic exudate into the pleural cavity or pulmonary tissue of rabbits is identical with the fatal form of septicæmia in rabbits, previously described by me, which is induced by the subcutaneous injection of human saliva.

c. In my own injections of pneumonic sputum, made subcutaneously, and of exudate scraped from a freshly cut section of a hepatized lung (six hours after death) I have obtained results identical with those obtained by injecting my own saliva into rabbits.[1]

d. Injections of cultures of *M. Pasteuri* into the pleural cavity of rabbits induce a fibrinous pleurisy, as is the case when pneumonic exudate is injected in the same way, and in both cases the blood is quickly invaded by the oval micrococcus and death occurs from septicæmia.

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[1] It is not my fault that these experiments have not been more numerous. I have done my best to obtain material in Baltimore, but not being connected with a hospital, and not having a private practice, I have been obliged to rely upon other physicians for assistance in obtaining pneumonic material for experimental purposes, and have been greatly disappointed in not securing a greater number of satisfactory samples during the season when pneumonia was most prevalent in this city.

e. The experiments of Talamon and of Salvioli show that the production of fibrinous pneumonia is not a constant result of injections through the thoracic walls of pneumonic exudate, or of cultures from the same. When it occurs it appears probable that it is due to the fact that the point of the syringe has penetrated the pulmonary tissue, and the injection has

Fig. 1.

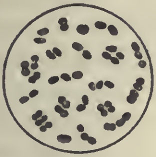

Fig. 2.

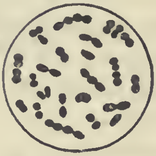

Fig. 1.—*Micrococcus Pasteuri* from blood of rabbit inoculated subcutaneously with normal human saliva (Dr. S.). Stained by the method recommended by Friedlander. Magnified 1000 diameters.

Fig. 2.—*Micrococcus Pasteuri* from blood of rabbit inoculated subcutaneously with fresh pneumonic sputum from a patient in the seventh day of the disease. Same staining and amplification as Fig. 1.

Fig. 3.

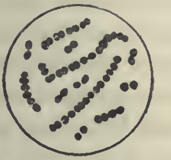

Fig. 4.

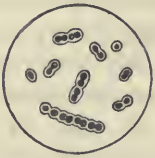

Fig. 3.—Surface culture of *M. Pasteuri* showing development of long chains. Same staining and amplification.

Fig. 4.—Surface culture of *M. Pasteuri* from blood of rabbit injected with pneumonic sputum, showing the so-called "capsule" of Friedlander. Same staining and amplification.

Fig. 5.

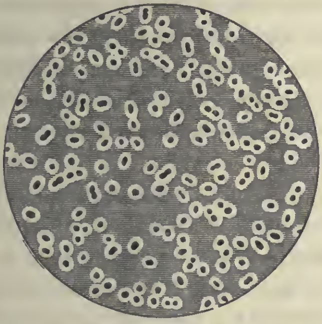

Fig. 6.

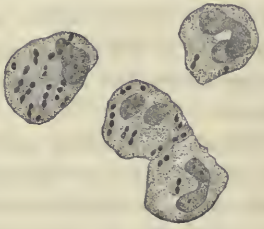

Fig. 5.—From a photo-micrograph made by the author of this paper in 1881, and used in April of that year to illustrate a paper on "A fatal form of septicæmia in the rabbit induced by the subcutaneous injection of human saliva." The preparation is from the blood of a rabbit recently dead, and is stained with an aqueous solution of iodine and potassic iodide. Magnified 1000 diameters. Photographed with Zeiss's one-eighteenth inch hom. ol. im. objective.

Fig. 6.—Copied from illustration accompanying the paper of Salvioli in the *Archivio per le Scienze Mediche*, Turin, vol. viii. Tar. viii. Fig. 2 "Cells of the pleuritic exudation containing pneumonia cocci, mounted in Canada balsam." Stained with gentian violet. Amplification not stated (about 1000, G. M. S.).

been deposited in the substance of the lung. This supposition is supported by the writer's experiment in which pneumonia resulted from an injection of a gelatine culture of *M. Pasteuri* directly into the substance of the lung.

The following corrections should be made in my first paper:—

Page 112, 10th line, *for* especially *read* specifically.
" 118, 22d line, *for* Fig. 2 *read* Fig. 1.
" 122, 7th line, *for* same *read* name.
" 123, 8th line, *for* Geiss's *read* Zeiss's.

ARTICLE XIII.

CALCULI REMOVED FROM CYSTS OF THE VULVO-VAGINAL GLANDS.

By A. VICTORIA SCOTT, A. M., M.D., of Philadelphia. With Comments by ROBERT P. HARRIS, M.D., of Philadelphia.

THE extreme rarity of this form of calculus gives the case here reported an unusual degree of interest. Two small concretions in so unusual a location might readily escape detection, as these did, on the part of several physicians, and it was only by careful attention to the sensations and directions of the patient that they were at last discovered and removed.

Mrs. A. H., aged 49 years, a mulatto, spare-built, and a cook in a restaurant, has been a widow since the age of 21 years. She commenced to menstruate at the age of 16, and after passing through two periods, was married, giving birth after eighteen months to a daughter, who still survives. Five years after her marriage her husband died, and at the age of 43 she ceased to menstruate. Three months after the menopause she noticed a swelling in the right labium near the posterior commissure of the vulva, which became quite painful, extended up along the postero-lateral side of the vagina, and finally burst into this passage, discharging a quantity of fluid which appeared to be largely composed of blood. This abscess closed, but a stinging sensation continued afterward where it had formed.

In time an attack of the same nature occurred on the opposite side of the vulva, but the right side gave the greater amount of discomfort. After this, one abscess formed after another on either side; medical advice was sought, but the exact character of the disease in all its features was not discovered, it being masked by sensations and pains at remote points which directed attention elsewhere than to the vaginal wall. The woman complained of intense itching and burning in the vulva, pains in the back, groins, and lower part of the abdomen, with at times an irritating leucorrhœal discharge. When active inflammation was in progress, she experienced an acute pain in the cysts, which became severe upon pressure, and even a slight touch excited painful feelings in her back, groin, and on the outside of the thigh of the corresponding side. These feelings were particularly marked upon the right side, and occasionally prevented the right lateral decubitus. She was also subject to attacks of urticaria, sciatica, and rheumatism. Her sufferings obliged her at frequent intervals to give up work and remain at home, and on one occasion she was disabled for eight months. Seeking relief she consulted a number of physicians, was under care in the clinic of the Woman's Hospital for a short time, and was also an out-patient for six months of the University of Pennsylvania.

Seventeen months ago she came to my office, when a vaginal exploration revealed the presence of two cysts, connected with the vulvo-vaginal glands, with a hard eminence on either side. As she declined the use of the knife at that time, I gave her some simple applications which afforded temporary relief.

In June, 1885, she returned, and expressed a willingness to undergo an operation. The vagina presented postero-laterally, on either side, a hard swelling. These varied, according to the state of the cysts, from the size of a pea to that of a shellbark, depending mainly on the amount of fluid collected, or the degree of inflammation present. The patient was led to find these "hard lumps" with her finger by the sense of pain experienced, and they were seated about two inches within the vagina. I discovered them to be centres of acute sensation, pains being set up under pressure in distant locations.

On July 2d, the woman being placed under the effects of ether by Dr. Caroline Peterson, I operated on her at her own home. With one finger in the rectum and another in the vagina, it was easy to determine that each swelling contained a hard, central, pea-like deposit. An incision brought the knife upon a calcareous body, contained within a capsule, which, being drawn out and opened, gave exit to a calculus of a white color, round and smooth. The right concretion was about $\frac{3}{16}$ of an inch in diameter, and the other $\frac{1}{8}$ of an inch. By drying they have diminished in size, due no doubt to the loss of fluid contained in their animal matter. Under the point of a needle they are hard and gritty, and may readily be scratched into powder. Their removal occasioned the loss of about a tablespoonful of blood. When the bleeding ceased, chromic acid was introduced into the cyst cavities. On the third day after the operation the patient claimed to feel less soreness than at any time in two years, and to be in a better condition than she has been in six. There still remain the two fistulous cyst cavities, which will probably refill and discharge; but the age of the woman should favor a treatment for their obliteration, as the functional activity of the glands must have largely diminished.

Dr. Robert P. Harris was kind enough to examine the patient, and to him I am much indebted for the following remarks and observations in reference to the case and the infrequency of this form of calculus.

The woman above referred to had undoubtedly a succession of attacks of inflammation, due at the commencement to the secretion of the glands of Bartholini having been retained, either by a stenosis of the duct, or partly contained in a cyst from the parenchyma of the gland, having no connection with the natural outlet, and more probably the latter, when we consider the age of the subject and the peculiar direction taken by the cyst-growths in their enlargement; a direction quite unusual in this vulvar disease. On some occasions when the cysts burst the discharge appears to have been simply the yellowish-white secretion natural to these glands; in others the fluid is described as brownish, which we know from other cases is due to an admixture of blood; and then again it was purulent, pus being added to the glairy secretion.

In young women, cystic growths of Bartholini's glands are due in a large proportion of cases to stenosis of the duct. The closure causes the infundibular portion of this conduit to dilate into an oval sac, which in some cases becomes spherical and in others pyriform, as it enlarges, and the size even of a hen's egg may be attained in some extreme cases, interfering very much with locomotion, as the thighs cannot be brought together without producing pain. The direction of enlargement is either along the labium toward the anterior commissure, or outward under the femoro-vulvar sulcus; the cyst may lie under either the labium majus or the nympha. But in the older woman under observation, the swelling, as described to me by her, commenced near the posterior commissure, exactly over the region occupied by the gland-duct of the right side, and extended along the vaginal wall, where it opened spontaneously. When the disease occurred on the opposite side, the extension was in the same direction. This form of extension is mentioned by Schroeder, in vol. x. of Ziemssen's Encyclopædia, in which he says: "The cysts of the glands of Bartholini are the most common of the cysts of the vulva. They may spring either from the excretory duct, or from the gland itself. In the former case they are oblong at first, and become afterward round, while those of the gland itself grow to a large size and exhibit occasionally a lobular form. They are situated in the labium majus, in the region of the gland or of its excretory duct, *though exceptionally*, and, as shown by Hoening, *they may extend up along the side of the vagina* into the true pelvis and even beyond the vaginal cul-de-sac."

Calculi formed in such cysts, from materials held in solution in the gland secretion, are of very great rarity, so much so that I cannot find any mention of such a disease, although I have examined a large number of works upon anatomy, surgery, and the diseases of women.[1] Nor can I find among our leading gynæcologists any one who has had a case or has heard of one. Thus far, Mr. Lawson Tait is the only one who has removed such a calculus, which he writes me he did some years ago.

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[1] M. Boys de Loury (*Revue Médicale*, March, 1841) mentions a form of fibrous cyst, having a thick and solid wall, in which osseous or gypsum-like plates have been found.

Nor in any work giving analyses of the minor concretions of the human body do I find any notice of this one. We find mention of calculi obtained from the salivary ducts, or found in the gland structure; of others located in the tonsil, prostate gland, the mesenteric glands, and even in the pericardium, eyeball, and nose. Huguier, of Paris, wrote the most thorough treatise upon the diseases of the secretory glands of the vulva that has ever appeared in any country, and presented it before the National Academy of Medicine in 1846. In the *Mémoires* of this Society published in 1850, it occupies 325 quarto pages, much the larger portion of which is devoted to the diseases of the vulvo-vaginal glands, and is handsomely illustrated by lithographic plates; but there is no mention made of any concretions. The author of this monograph had abundant opportunities for observation in a city where the morals of young women would appear from his reports to favor the production of disease in the glands of Bartholini; he made dissections of the diseased structures, and reported a large number of clinical cases. His classification of the non-specific diseases of these glands is as follows: 1. Simple hypersecretion; 2. Muco-purulent secretions; 3. Engorgement or chronic inflammation; 4. Induration and fibrous degeneration of the gland; 5. Acute inflammation of the follicular body; 6. Abscess of the parenchyma; and 7. Abscess of the excretory cavity. To these we may add an 8, Atrophy and absorption of the gland tissue. Simple hypersecretion belongs to the active functional period of these glands, which, in the experience of Huguier, is from the age of 18 to 27. He had rarely met with a diseased gland under 17 or above 45; where seen at 50, the affection had long existed.

The vulvo-vaginal glands are almost universally called the glands of Bartholini, after Caspar Bartholinus or Bartholini II. of Copenhagen. They are sometimes given the name of Duverney or of Méry. There were three of the Bartholini family who were all anatomists, and all wrote medical works, but the third was most devoted to anatomical researches. They were Caspar I., Thomas his son, and Caspar II. son of Thomas and grandson of Caspar I. Danes by birth, they were cosmopolites in their residence, studies, and knowledge of languages, being fond of travel, and quite at home in Germany, Italy, and France. Caspar II. was led, by the celebrity of Dr. Joseph Guichard Duverney, 1648–1730, of Paris, to go to that city to complete his medical education, and especially to enjoy the advantages afforded for the study of anatomy under this celebrated teacher, who graduated at Avignon when only 19, and was at the time under 28 years of age. Here he graduated as M.D. in 1678; but, before he obtained his degree, he published at Rome, in 1677, his little book *De Ovariis Mulierum et Generationis Historia*, in which is the first account of the racemose glands which bear his name. This work was republished in Amsterdam in 1678, in Nuremberg in 1679, and in Lyons in 1696, but is at the present day one of the most rare of the many works of the three Bartholinis. The anatomical plates of Duverney, in which the location of the glands is indicated, were not published until much later. Méry was an enthusiastic student of anatomy, and a cotemporary of both Bartholini and his preceptor (1645–1722), but has no claim to the discovery. Dionis,[1] an associate of Duverney, evidently did not know the source of the secretion furnished by these glands, which he attributed to *lacunæ* near the urethra.

During its period of functional activity, the gland of Bartholini is capable of secreting, notwithstanding its diminutive size, a large quantity of fluid, which has to escape through a duct only of sufficient calibre to admit an eye-probe. Located as it is, and subject to the effect of inflammation originating in neighboring tissues, it is not to be wondered at that the excretory duct is liable to stenosis, resulting in an accumulation of secretion between the gland and the point of closure. Where the canal is still pervious, the patient may relieve the discomfort of tension by emptying the cyst under digital compression; but where entire closure has taken place, the knife alone can give relief, or a spontaneous evacuation will take place by ulcerative action. As these glands are usually unequally developed, it is rare to find both of them affected at the same time. Huguier gives in his plates one example where the stenosis was bilateral. Such a marked case, if occurring centuries ago, one would suppose might have led to the discovery of these long-overlooked glandular bodies.

August 3, 1885. My attention was called to-day to the condition of Mrs. H., whose physician is absent, and who is under the care of another. She was fully relieved for a few days by the removal of the calculi, but now is suffering from the discomfort of the discharging fistulæ which will require special treatment for their obliteration. Excision of the cysts is not to be recommended, as cases have been cured without a resort to the knife, and the vascularity of the parts involved makes it advisable to resort to more simple measures. As tincture of iodine has failed in this case and many other cases, and as a number have now been radically cured by injections of chloride of zinc in strong solution after failure with the iodine, this plan of Lizé,[2] Duvernoy,[3] and others will be given a trial. Lizé's injection consists of 50 centigrammes (7¾ grs.) of chloride of zinc, and 5 grammes of distilled water, or 1 part to 10. Of this solution Duvernoy used but six drops, by hypodermic syringe, and a cure was effected. The *tube à drainage* of Chassaignac has also been successfully employed, as has the elastic ligature. The locality of the fistulæ in the present case may make it one of unusual difficulty to treat successfully.

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[1] Treatise on Midwifery, English Translation, pp. 42 and 105, 1719.

[2] Bulletin et Mém. Soc. de Chirurg. de Paris, 1876, N. S. ii. p. 129.

[3] Annales de Gynécol., 1880, xiii. pp. 251–254.

As quite a number of physicians had failed to detect the calculi in this woman, whose own sensations finally led to the form of examination which discovered them, I asked her why it happened; and she replied that they interrupted her before she had fully explained to them her case as indicated through her feelings, when certain sensitive points were touched, those chiefly noticed being the points of hardness already referred to.

ARTICLE XIV.

OBSERVATIONS ON THE OLEATES.[1]

By HENRY W. STELWAGON, M.D., Physician to the Philadelphia Dispensary for Skin Diseases, Chief of the Skin Dispensary of the Hospital of the University of Pennsylvania, etc.

IT is to be regretted that the therapeutical uses of the oleates have not been passed upon by a greater number of observers. The claims regarding their therapeutical importance in dermatology have been so extravagant, that in view of my own observations I am at a loss to explain the wide discrepancy. In regard to the chemistry and preparation of the various oleates, both as to their manufacture by the direct combination of the acid with the base and by double decomposition, almost, if not entirely, as much can be found in the English translation of Gmelin's Handbook of Chemistry, published in 1866, as in the writings of the past several years. Willing to grasp anything new that promised an advance in cutaneous medicine, I have experimented somewhat largely with the different oleates, and in a paper published in the *Medical and Surgical Reporter* of March 15, 1884, expressed the following opinion: "In conclusion, it may be said, that the oleates are to be considered merely as additional means of treating diseases of the skin, and are in no sense to be looked upon as specifics, for often enough they must be discarded to give place to the older and more tried methods of dermic therapeutics." After a still further investigation of the subject, I am convinced that the judgment then pronounced was too favorable. In the paper referred to the conclusion was also reached that of all the oleates those of mercury, zinc, lead, and bismuth deserved confidence.

The most important of these several preparations is the mercurial oleate. The physical properties of this salt are too well known to call for description. As sold in the shops, however, it is in the form of a ten or twenty per cent. oleate, which means a certain amount of the oleate with free oleic acid. The chief use made of this oleate has been for the purpose of impressing the system by means of inunctions in the treatment of syphilis. Clinical observation has convinced me, however, that for this purpose it is not comparable to the old blue ointment. In fact, after a somewhat extended use of this oleate, probably limited compared with that of others, I cannot recall a case in which symptoms of salivation were observed. In regard to the ready absorbability of the oleate thus brought in question, my observations clinically made are in accord with the experiments made by Dr. Brubaker, of Philadelphia. In a series of personal inunctions, also, experimentally practised, the oleate failed to produce any constitutional effect, while with the blue ointment symptoms of the physiological action of mercury were rapidly experienced. I refer of course to the pure oleate. An impure or partly decomposed oleate, as is usually sold, contains free mercury, and if such a preparation is mixed with a fatty base, inunctions may in susceptible individuals have a systemic effect, as it is then somewhat similar to blue ointment, although only fractionally as strong.

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[1] Read at the Ninth Annual Meeting of the American Dermatological Association, held at the Indian Harbor Hotel, Greenwich, Conn., August 26, 27, and 28, 1885.

The mercurous oleate, mixed with lard, is for the purpose of inunction considered superior to the mercuric oleate, and no doubt is, for the reason probably that it is an unstable salt, quickly decomposes, and hence, as usually found, contains a greater quantity of free mercury.

While my observations lead me to infer that the pure oleate of mercury compared to the blue ointment is practically inert for use in the inunction treatment of syphilis, they are far too limited and too antagonistic to the general belief and practice to warrant a positive assertion without confirmatory evidence. The local irritating effects of the oleate in inunction are by no means trifling, and occasionally prove an obstacle to its employment.

It is especially in the treatment of ringworm of the scalp that this oleate is found of greatest value. In my experience it is for this disease one of the most reliable remedies, but, like all other remedies for this affection, it sometimes fails, although less frequently. Its use should be continued for weeks, and more frequently for months. An ointment of one part of the oleate in four or five of melted lard is a good formula, and is superior to a solution of the oleate in oleic acid, as the latter is more apt to produce crusting. The spots or entire scalp, as the case may be, is to be rubbed thoroughly once or twice daily with the ointment, and the excess wiped off with a linen rag. The parts are to go unwashed for a week or more, so that the oleate ointment may soak into the follicles. Epilation is to be practised as an essential part of the treatment. The ointment of the strength suggested above rarely, if ever, proves irritating to the scalp, but it may, if it is carelessly allowed to run over on the forehead or neck, give rise to varying degrees of irritation; even on these parts, however, the irritation is rarely marked. Some cases respond rapidly to this plan of treatment, while others yield more slowly. In addition to the efficacy of this ointment in chronic ringworm of the scalp, in that other form of the affection, tinea sycosis, it will occasionally act as a specific. For lack of opportunity I have not used the oleate in favus, but it will probably be found equally efficacious in this disease.

Another use of this oleate is as a substitute in ointments for the other mercurials, calomel, ammoniated mercury, and the nitrate of mercury. For local stimulation in the cutaneous lesions of syphilis a ten or twenty per cent. ointment makes one of the most efficient applications.

The oleate of zinc is another oleate of some value. It possesses astringent and stimulating properties. Melted with three or four parts of lard or vaseline it forms a good ointment, and is frequently of service in eczema and similar inflammations. As a dusting powder its value has been overestimated. In my former paper I was inclined to consider it an addition to this class of remedies, but greater experience has taught me that for this use it is, as a rule, impracticable, as in the presence of heat or moisture (the heat and moisture of the body are sufficient), it becomes sticky and the particles become aggregated; moreover, it has very little, if any, absorbent power. In some instances its use as a powder was followed by marked irritation, nor could this effect be attributed to the quality of the powder used. The oleate of zinc in ointment compared to the oxide of zinc is more astringent and stimulating, but much more likely to disagree.

The oleate of bismuth either alone or in combination with lard or a similar base forms, if properly made, a mild soothing ointment which may be advised in all cutaneous inflammations.

The oleate of lead melted with an equal part of vaseline forms an astringent, soothing ointment, an excellent substitute for diachylon ointment, and will keep indefinitely. In winter temperatures the proportion of vaseline should be increased. It is scarcely necessary to enumerate the diseases in which it may be advantageously used, as its astringent and soothing properties are sufficiently indicative.

The oleate of copper is another oleate about which much has been written, especially as to its value in ringworm of the scalp, but it has failed in my hands to deserve the claims made for it. As with all parasiticides it will cure simple cases, but for the chronic, stubborn cases frequently met with, it is not comparable to the oleate of mercury or to tar and sulphur preparations. In regard to the other oleates, such as nickel, aluminium, tin, cadmium, arsenic, etc., which have also been used in the treatment of diseases of the skin, they possess, as far as experience goes, no claims to special therapeutic power.

While the oleates of mercury, bismuth, lead, and zinc have certain advantages, which have been pointed out, there are several difficulties in the way of their gaining permanent popularity. The oleic acid odor which characterizes all the oleates is a decided disadvantage; it is peculiar, disagreeable, and cannot be covered up. Although apparently simple and easy of manufacture, yet a good preparation is not generally procurable, is in fact exceptionable. They are expensive and therefore unsuitable for dispensary and general use, as just as much in quantity, of the oleates or their ointments, is required, if properly used, as in the employment of other ointments. . Further, while the most of the oleates, if rightly prepared, show very little tendency to decompose or to become rancid, this cannot be said of the commercial preparations usually met with. Lastly, the oleates, even when good preparations, will frequently prove irritating, and thus give rise to uncertainty as to effect. It is true the same may be said of simple lard or vaseline, but this occurs so rarely with these latter as to be exceptional; not so with the oleates.

In conclusion, it is difficult to place the status, present and future, of the oleates in cutaneous therapeutics, but from the observations of competent authorities in the past year or more, taken with the results of my own experience, and in view of their disadvantages as mentioned above, my conviction, provisionally stated, is that of all the oleates (those employed in diseases of the skin referred to) the oleate of mercury, the oleate that has been longest in use, is the only preparation that promises to hold a permanent place, and even that is likely to recede considerably from the prominence it held a few years ago.

ARTICLE XV.

THE CURE OF EXTRA-UTERINE FŒTATION BY ELECTRICITY.

By HENRY G. LANDIS, A.M., M.D., Professor of Obstetrics and Diseases of Women in Starling Medical College.

IT may be regarded as an accomplished and proven fact that electricity in some form is a specific cure for extra-uterine pregnancy. It arrests the growth and destroys the vitality of the embryo and cyst, and its use is followed by a truly remarkable disappearance of all or the greater part of the growth in a short time. This at least is true when the electricity is used during the first half of the pregnancy. As we approach the period of viability in the child the risk of rupture of the cyst diminishes, and the propriety of surgical interference at or near term becomes greater.

Experience is lacking as to the comparative effect of laparotomy as contrasted with the retention of an electrically destroyed fœtus of large size. Nor are we likely to acquire such experience, for the child at or near term has acquired rights of existence which it did not have at an earlier period. The life of an extra-uterine fœtus at three months is worth next to nothing, because of the tremendous risks to which it as well as the mother is subject. At term the risks have mainly been passed, except such as are conquerable by abdominal surgery. For the present, then, we may limit the beneficent effects of electricity to the first half, or thereabouts, of the pregnancy.

The great advantages of the faradic current over all other forms of electricity have been hitherto pointed out. Its convenience and portability will continue to recommend it to the general practitioner as long as the present state of information in matters electrical obtains. One practical point in its use remains to be elucidated, and hitherto those who have had to use the battery have had to grope in the dark.

Shall we use a weak current for a long time, or a strong current briefly, and how many repetitions of the application are necessary? The published reports of cases, my own included, will show that on this point uncertainty has prevailed. To clear it up, if possible, I have conducted the following series of experiments. They are based upon the supposition that success is achieved by the death of the embryo; the *specific* value of the method being that the fœtus will surely be killed if it gets a large enough dose of the current. If a man is struck by lightning, he is certainly killed if the current is strong enough, otherwise he may recover, perhaps without injury. In operating upon an extra-uterine cyst, we remember that we have also a woman to deal with, and we must not kill two birds with one stone. Therefore, *a priori*, we would prefer to destroy the fœtus with mild currents, repeated as long and as often as necessary, if it can be done, rather than to endanger the mother by sharper shocks. There is also in the latter method a theoretical danger of causing rupture of the cyst, on account of the sudden spasm which a strong current may induce in its contractile envelope. Also the discomfort is very great when strong currents are used.

The experiments are also based upon the supposition that the fœtus is in the matter of vitality to be compared with some of the lower forms of life.

Insects were therefore first chosen. After a few unsatisfactory attempts upon flies, the following was conducted:—

Experiment I.—A large beetle (*Lucanus dama*), two inches long, was connected with the poles of a Fleming faradic battery. This battery was used in all the experiments, the poles (unless otherwise stated) being placed in one and four. The chitinous envelope of insects is a complete insulating material. The poles were therefore provided with large needles, and one needle being pushed into the beetle's mouth and œsophagus, the other was introduced into its anus and pushed into the abdominal cavity. The full strength of the battery was then turned on, the coil being completely uncovered. Such a current would be unendurable by a human being for more than a few seconds. The beetle at once presented the appearance of death (which it is not accustomed to feign), becoming motionless. The current was continued for *one hour*. It was then stopped, and the apparently dead beetle was placed on a table. On re-entering the room two hours later the beetle was found on the floor, running towards me in a lively manner, as if to ask for more.

This experiment was repeated and varied, but the upshot of them all was that the faradic current will not kill insects with any certainty.

The next series was performed upon fish, there being many points of resemblance and analogy between a young human fœtus and a fish. The species selected, *ex necessitate rei*, were minnows, probably of the genus *Hudsonius*. All American minnows, according to Jordan, are of feeble organization, and ought therefore to succumb readily to electricity. In conducting the experiments a minnow was placed in a china basin of water. The electrodes were then introduced into the water at some distance from the fish, one on each side. This was thought to be an essential feature in any course of experiments, since the fœtus also exists in a liquid, although its placental connection allows of some direct transmission of the current. It was soon found that the electrodes, or one of them, had to be brought quite near to the fish in order to overcome the resistance of the water unless a very powerful current was used.

Experiment II.—One minnow. Current 1–4 for ten seconds. The minnow turned over as if dead, but recovered slowly; in twenty minutes completely.

Experiment III.—Same minnow and another. Current for seventy seconds. Prompt suspension of animation, but both began breathing in one minute; in a half hour, irritation provoked voluntary movements, and they then swam about unconcerned.

Experiment IV.—Same minnows as in III. Current for three minutes. Minnow No. 1 dead. Minnow No. 2, gills moved feebly within one minute after the suspension of the current, and continued for ten minutes longer, after which death occurred.

These experiments were made with a very weak secondary current, and with the coil entirely covered. As far as they go they show that such a current has the power to tire out the animal if repeated sufficiently.

Experiment V.—Fresh minnow. Current 1–4, but with the coil uncovered, the most powerful attainable with this battery. Current for five seconds. Immediate arrest of respiration and apparent death, succeeded, after the removal of the current, by active but uncoordinated movements. Entirely restored in five minutes.

Experiment VI.—Same minnow; same current for one minute. Apparently instant death. Almost immediately after cessation of current the same movements as in IV. In five minutes completely restored.

Experiment VII.—Same minnow; same current for two minutes. Instant and permanent (!) death.

Experiment VIII.—Fresh minnow. Same current for two minutes. Instant cessation of respiration and death without recovery.

Experiments V. VI. VII. tend to show that even a powerful current needs to be repeated, or, judging from VIII., to be continued for a long time.

Experiment IX.—Fresh minnow; current 1–4, but with coil covered, for two minutes. Respiration did not cease entirely for one and three-quarter minutes, and in twenty-five seconds after cessation had recommenced. In one minute, more complete recovery.

Experiment X.—Same minnow; four minutes later reapplied the same current for three minutes. Gills moving feebly during the entire application, and restoration complete in fifteen minutes.

Experiment XI.—Same minnow; sixteen hours later. Very active. Applied same current as in IX. and X. for four minutes. Death prompt and complete.

Although the current 1–4 with coil covered is a very moderate one, the battery will give still feebler ones. A single experiment is sufficient to demonstrate their inutility.

Experiment XII.—Fresh minnow; current 1–6 for ten minutes; without apparent effect of any kind. Current suddenly changed to 1–4 and continued for one minute. Apparent death almost at once. Respirations began almost immediately after the removal of the current. Full recovery in a few minutes.

Experiment XIII.—Same minnow; current 1–4, three minutes. Death.

Experiment XIV.—Fresh minnow; current 1–4, for ten minutes. Perhaps from superior strength it was not much affected for two minutes and forty-five seconds. It then turned over, and the gills moved feebly during the rest of the application. As soon as the current was removed, it righted at once, but continued feeble and sluggish for seven minutes, then recovering completely.

Experiment XV.—Same minnow; fifteen minutes later; quite brisk. Same current for one minute. Profound quiet for the first three-quarters of the minute, respiration beginning feebly at that time. Completely restored in five minutes.

Experiment XVI.—Same minnow; shortly after recovery. Same current for three minutes. Very little affected.

Experiment XVII.—Same minnow; five minutes later. Full current, coil uncovered, for three minutes. Respiration continuous throughout the application, though feeble, and the minnow turned over at once. In thirty minutes was swimming about, but an occasional lurch betrayed weakness. Was placed in the aquarium with untouched minnows, but died during the night.

The general harmony of these observations with clinical experience is remarkable. Life (at this level) may apparently be destroyed at once, but in reality is only suspended, and repeated shocks are necessary. It reminds one of the nine lives of a cat.

I made no experiments upon pregnant mammals, because the presence of the uterus necessarily vitiates the result. The current induces uterine contraction; this causes compression of the placental circulation at least, and expulsion from the uterus if continued. Instead of this, new-born rabbits were selected as being very tender creatures, and likely to be easily influenced by the current.

Experiment XVIII.—Rabbit, a few hours after birth. Mild current for one minute, with little evidence of any inconvenience.

Experiment XIX.—Same rabbit; one inch of coil uncovered for thirty seconds, when the full force of the battery was turned on for thirty seconds. No apparent effect upon the animal, except in struggling to get away at the first. He was replaced in the pen and lived to grow up.

Experiment XX.—Rabbit from another litter. A few hours old. Its parent (or a rat) had removed one ear and the toes from the hind leg on opposite side. Full current for one minute. The animal seemed feeble afterwards.

Experiment XXI.—Same rabbit three minutes later. Full current for one and a half minutes; waited then for two minutes and reapplied current for three minutes. At the close it lay quiet, scarcely breathing, but reflexes were easily excited. It seemed cold, in part from the wetting with the sponge electrodes, though the day was hot. After warming it apparently recovered entirely in about ten minutes.

Experiment XXII.—Same rabbit thirteen minutes later; full current for five minutes. A few feeble respirations afterwards, but within five minutes was dead.

Experiment XXIII.—Another rabbit, also marked by loss of one ear. Full current for five minutes. Soon regained its former appearance and recovered.

In these experiments the electrodes were placed upon a shoulder and the opposite rump. In the second rabbit the current was in one application given through the wounded surfaces, but without special difference. The results were certainly unanticipated, and constitute further proof of the comparative immunity from electrical influence of the lower animals.

Conclusions.—I think we are warranted in drawing these conclusions from the facts observed:—

1. In using the faradic current in extra-uterine pregnancy, the applications should be protracted for an hour, if the patient can bear it.
2. The current should be repeatedly applied, in order that the vitality of the fœtus may be finally exhausted.
3. The current should for at least one sitting be used in great strength.
4. The current probably acts, not only by destroying the fœtus, but by its action upon the placental circulation; an additional reason for a long application.

ARTICLE XVI.

A NEW DISCISSION INSTRUMENT. By ALBERT G. HEYL, M.D., Ophthalmic Surgeon to the Episcopal Hospital, Philadelphia.

A COMPARATIVELY large number of operations have been devised for making an opening in the capsular or capsulo-lenticular structures so often found after cataract extractions. They may be classified as follows: 1. Those in which an opening is made in the cornea large enough to admit of the direct manipulation of the membrane; *e. g.*, the Wecker operation, with *pince-ciseaux*, the similar one of A. Weber, the Noyes operation with Graefe knife and blunt hook. 2. Those in which the capsule is acted on through the medium of the cornea. Such are the various needle operations. This method of operating is much less rough than the former, and therefore much to be preferred if it can be made effective.

To accomplish this result it is necessary to bear in mind the conditions under which the operation is made. The object is to make a hole of sufficient size for useful vision in a membrane of varying density and more or less yielding; this is to be accomplished by an instrument which must pass through the cornea. If needles are used, as I shall suppose, the action will be largely that of a lever of the first class. The fulcrum will lie in the cornea, the capsule will be the weight lifted, and the force will be applied to the handle of the instrument. If the edge of the needle be sufficiently sharp, and the capsules not too tough, and sufficient tension be made, an opening in the capsule will result, from cleavage of the tissues, when the needle is rotated. It will at once be seen that the keener the edge presented to the membrane the better. The ordinary cataract-needle is a very poor instrument for such a purpose, and indeed for operating on a soft cataract. It is an instrument constructed for piercing rather than cleaving in a direction at right angles to its axis. A much better instrument is the knife-needle of Dr. Hays, described in 1855.[1] In this a knife edge is ground on the needle which can be keenly sharpened while the back is bevelled to a point, so that there is the combination of cutting and piercing qualities. This invention of the Hays needle was a great improvement; it was originally intended for operating in lenticular cataract, and as such answered an excellent purpose. It is, however, not so well adapted for the division of secondary cataracts; the membrane offers too little resistance; it will be lifted, but not divided. What is needed is a slight cutting motion in addition to the lever action; this would prevent also a good deal of dragging on the membrane—a very desirable thing.

The discission of a capsule is not always the simple thing that it is sometimes thought to be. Eyes, which to all outward appearances were perfectly free from irritation, have been lost by it; no doubt in some of these cases there was insidious intraocular trouble, but it was the irritation of this little operation which brought the thing to a focus. I have endeavored, with the instrument which I am about to describe, to make the same motion which rotates the needle communicate a cutting motion to it. This is accomplished by making the needle angular instead of straight. The effect of this is that when the handle is rotated the back of the needle rests on the corneal tissue, and the blade of the needle glides forward with a cutting motion. The principle of this is the same as is exhibited in the action of the angular lance-shaped iridectomy knife. In this instrument, as is well recognized, the forward motion to the point in the anterior chamber is given, not by endeavoring to press it directly forward, but by pressing in the direction of the shaft; the construction of the instrument being such that the *resultant* of the forces will lie in the plane of the blade and the point will move forward. It is not to be supposed from this that in using my needle the cornea is pressed upon in a marked degree; the amount of movement is so slight and so delicate that the sensation of pressure is hardly if at all perceptible.

The instrument, as accurately made for me by Mr. Gemrig, is represented in the drawing. The blade is essentially that of the Hays needle, but the cutting edge is only half as long. The cutting edge is 5 mm.; in length 11 mm., from the point the shaft of the needle is bent at an angle of about 15°, and from this point on to the handle is of increased diameter after the manner of the stop needle of Bowman; this gives increased strength to the instrument, and at the same time prevents the needle from penetrating too far. The cutting part of the instrument may be described as being made by taking a metal bar of the dimensions of the ordinary cataract needle, and forming one end into a triangular pyramid; the altitude of the pyramid being about 5 mm. The vertex of the pyramid will be the point, and one of the edges the cutting edge of the instrument.

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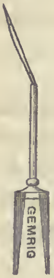
[1] AMERICAN JOURNAL OF THE MEDICAL SCIENCES, July, 1855.



Experience has shown that the following is the best way of using this needle: The needle is entered into the cornea and then into the capsule with the hand semi-supinated. The hand is then semi-pronated; the wrist turns and with it the hand; the handle of the instrument moving with the hand describes an arc of about 90°. The instrument may then be withdrawn, and a clean cut of three to four mm. will be found in the capsule. What has taken place is this: In the first place there is the lever motion; were this all, however, in many cases, as experience has convinced me, the capsule would simply move with the needle and not be cut at all; in addition the needle moves forward with a cutting motion, and separates the tissue. The manœuvre may be studied by bending a pin at the same angle as the instrument blade and inserting it into a handle; if a card be notched and the pin be placed in the notch, the hand holding the handle in the position of semi-supination, the point of the operation will be represented at which the needle is engaged in the capsule. If now the hand be thrown into semi-pronation while the pin is pressed a little against the card, the instrument will be felt to slide forward. In this experiment it is necessary in the first position to press the pin against the card a little, otherwise there will be simply a lever motion; but in operating on the eye no effort at pressure is necessary, the wrist movement only being required; the cutting motion will take care of itself.

This instrument has given me great satisfaction. Possibly it may find more extended use than that indicated above. I have used it in the needle operation upon lenticular cataracts; the only thing noticeable was the ease with which the instrument passed through the lens. I have also used it in a case of cataract extraction where one corner of the iris had healed in the wound; the instrument was passed into the iris close to the coloboma, and the endeavor made to cut through the engaged portion so as to free it; no bad result followed from it, but I am uncertain as to whether I fully accomplished my purpose. Perhaps a little difference in the point of entrance of the needle would have produced a more evident result.

1535 PINE STREET.

ARTICLE XVII.

ANEURISM OF AN ARTERIA INTERLOBULARIS RENALIS.

By S. T. ARMSTRONG, Ph.D., M.D., Passed Assistant Surgeon U. S. Marine-Hospital Service.

As far as can be ascertained the following case is unique in medical literature, Surgeon J. S. Billings informing me that there was no report of such a lesion in the Library of the Surgeon-General's Office, U. S. A.; and, aside from its pathological features, it is of interest as a factor for consideration in the diagnosis of, and operative treatment for, abdominal tumors.

A. H. P., male, aged 50, native of New York, occupation barkeeper, was admitted to the St. Louis City Hospital on the evening of May 20, 1879. He was a man of large and fleshy frame; was comatose; skin very pale; Dr. W. H. Hunicke, who made the physical examination, diagnosed pleurisy, enlarged liver, and tumor of the right kidney. No record of illness was obtainable; the patient sank gradually, dying some hours after admission.

I made the autopsy eight hours after death. No external lesion of skin.

On opening the thoracic cavity, the right lung was found adherent to its pleura by numerous recent fibrinous adhesions; the right cavity contained almost 250 c.c. of serous effusion. There were a few pleuritic adhesions of left lung and a small quantity of fluid in its cavity. The heart was firmly contracted, the valves normal.

The abdominal incision allowed a quantity of bloody fluid to escape at the pubic termination. Lifting the omentum, which contained much fat, several blood-clots were exposed between the intestines. These latter were normal. The stomach was congested internally. Removing the stomach and intestines, some 300 c.c. (10 ounces) of free blood were found in the abdominal cavity, and a large clot extended upward under the liver. The right kidney was apparently greatly enlarged, its capsule adhering to the peritoneum and intestines, with other evidences of a circumscribed peritonitis. The capsule was ruptured posteriorly, and from this opening the hemorrhage into the abdominal cavity occurred. Incising the capsule, its enlargement was found to be the consequence of a black, easily disintegrated, hemorrhagic clot, within which was the kidney. The clot was equivalent to 900 c.c. (30 ounces). The kidney was slightly eroded on its surface, and in the external border was a small spherical cavity, about 1 mm. (one twenty-fifth of an inch) in diameter. The tubuli were pressed away, not destroyed, and there was a well-organized fibrinous clot. This was the *fons et origo* of the hemorrhage; and as it contained the only well-formed fibrin that existed in the exudate, and from its shape, I considered it an aneurism of an interlobular artery. The left kidney was imbedded in a mass of fat; it was slightly enlarged, of pale color, and was evidently the seat of a chronic nephritis. The liver was enlarged, of a light brown color, covered with small nodulations, cirrhosed. The spleen and pancreas were normal.

The deposit of subcutaneous fat, the congestion of the stomach, cirrhosis of the liver, nephritis, and occupation of the patient, point to alcohol as the predisposing cause of disease.

Associated with the first pathological lesions in this kidney, due to the abuse of alcohol, was, probably, a dilatation of this interlobular artery. Had this ruptured, either the blood would have been absorbed by the tubuli, or a small localized hemorrhagic infarct would have resulted, which would have been partially absorbed, partially degenerated, resulting in one of those small yellow spots occasionally found in a kidney. Instead, the increased arterial pressure concomitant with the disease, plus the additional pressure in this special artery at its point of localized dilatation, resulted in an aneurismal condition. Having involved the cortex of the kidney, it ruptured, with the capsule as part of its wall. A dissecting aneurism now commenced slowly filling the capsule, separating it from the kidney, exciting the localized adhesions, and eventuating in rupture and death.

Although from the beginning the cause of the trouble would have been obscure, still, had an operation been performed early enough for renal tumor, the death of the patient from hemorrhage would have been prevented.

The only case resembling this is one reported by Dr. W. H. Dickinson,[1] of congestive nephritis resulting from exposure, in which, at the autopsy, each kidney was found "imbedded in a mass of coagulated blood which lay *outside their capsules* in the surrounding cellular tissue. This hemorrhage was caused by a *rupture* of the capsule from congestive swelling of each kidney." [Italics mine.] The rupture in each gland was at the inferior portion.

Surgical interference in such a case would have been unavailing. The indications in my case would have been the gradual but constant increase in size in the tumor, with the symptoms of internal hemorrhage.

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[1] Treatise on Albuminuria, Wm. Wood & Co., 1883, p. 59 *et seq.*

ARTICLE XVIII.

ACUTE PERITONITIS, RESULTING IN SUPPURATION, TERMINATING IN RECOVERY.

By FREDERICK LLOYD, M.D., formerly Surgeon U. S. Vols., late Acting Assistant Surgeon U. S. Army, Iowa City, Iowa.

THE following briefly described case occurring in my practice, for which neither my experience nor research affords a parallel, I consider worthy a place in the records of medicine, as being unique, or at least of exceedingly rare occurrence.

E. H., a girl nine years old, of previous good health, February 26, 1885, was laboring under unmistakable symptoms of acute peritonitis, following persistent constipation. To relieve the latter, castor oil in repeated doses had been empirically and ineffectually administered on the two previous days. A simple enema now given was followed by a solid evacuation. The usual treatment, including opium, was at once instituted, resulting in amelioration of the condition of the patient by the next day.

From this date (the 27th) the frequency of the pulse was gradually reduced from 140 to 100, the respirations from 40 to 26 per minute, and the temperature from 104° to 99°; the abdominal pain and tenderness diminished, the tympanites subsided, the kidneys were active, the skin moist, the bowels easily freed by injections, repose was secured, thirst allayed, and the appetite returned. From day to day improvement went on in all particulars, except that the abdomen remained tumid, and in a few days, instead of diminishing in size, began to enlarge, and to exchange the tympanitic sound on percussion for one of dulness, a change which was accompanied by a diminution of the urinary secretion. It was evident that the enlargement of the abdomen was due to liquid effusion, and it was believed that the case was now converted into one of ascites. The diuretics administered were without effect. Constantly from day to day the abdomen, maintaining its symmetrical proportions, continued to enlarge, while improvement in almost every other particular progressed.

On the 23d March, twenty-seven days from the first seizure, the integument of the pouting umbilicus, which had been tender for a few days, was noticed to be inflamed and soft, and presented the appearance of containing pus, which, however, was supposed to be superficial. This little tumor a few hours later broke, giving exit to a stream of pus the size of a quill, with such force as to discharge the matter for some time clear of the body, reclining in the dorsal posture. In six hours about one gallon of pus, of a slightly alvine odor, of the color and consistence of cream, had been discharged, the quantity having been at first measured, and afterwards estimated.

The discharge, slowly diminishing in quantity, continued for forty hours, when (on the 25th) the orifice at the umbilicus became sealed.

On the 26th the discharge recurred, continuing till the 31st, when it ceased as before to be resumed again the next day. In this way the discharge alternately ceased and recurred, the intervals of cessation having been each succeeding time generally prolonged, and the periods of activity shortened, till in the second week in June it finally ceased altogether, the abdomen having resumed its normal size and form, and the patient having regained her usual health and strength.

Effusion of pus into the cavity of the peritoneum is one of the constant *post-mortem* evidences of the recent existence of acute inflammation of this membrane, but (not pretending to extensive research on the subject) I know of no recorded case going to prove this condition as existing in patients making recovery. In an article on Peritonitis by Dr. Alonzo Clark in Pepper's *System of Medicine*, volume ii. page 1136, reference is made to abscesses of the peritoneum, some of them pointing at the umbilicus as a consequence of acute peritonitis, but the cases alluded to seem to have all terminated fatally.

The case that I cite may go to show that acute suppurative peritonitis may result in recovery, without our knowledge of the existence of the suppuration, the effusion in such instances being small in amount, and therefore capable of being absorbed and eliminated.

REVIEWS.

Art. XIX.—*Transactions of the American Gynæcological Society.* Vol. IX. For the year 1884. 8vo. pp. 408. New York: D. Appleton & Co., 1885.

This society now numbers 53 active and 17 honorary Fellows, and the volume under review records the proceedings of the meeting held in Chicago, September 30, and October 1 and 2, 1884. Papers, including the presidential address, were contributed by 14 Fellows; and 12 others entered into the discussions, some of their remarks being given at considerable length. Thus, above one-half of the society were actively engaged in making up the volume, an evidence of the care which has been exercised in selecting the membership, and of the fact that character is of more value than numbers in a scientific body. As the number of Fellows is limited to one hundred, it is not likely in the future to fail in activity by being overburdened with drones.

The address of the President, Dr. Albert H. Smith, is in the form of a monograph, entitled *The Present Aspect of the Puerperal Diseases*, the main point of which is the malady or family of maladies known as puerperal fever or fevers. He defines this "as a febrile condition occurring in a woman from two to four days after the termination of pregnancy, either at full term, or prematurely, characterized by typhous symptoms, high temperature, and frequent pulse, the rapid formation of local centres of inflammation, suppuration, and gangrene, metastatic abscesses, emboli, a violently phlogogenous condition of the blood, and, unless arrested, running on rapidly to disorganization and death."

Labor and the normal processes of recovery therefrom are generally admitted to be physiological, and not claimed to be pathological, although some modern extremists incline very forciby toward the latter view, and act accordingly in their practice.

The author discusses at length the various theories which are held by writers of experience as to the character of the puerperal poison, whether autogenetic or heterogenetic; whether one or multiple in character; whether due to a specific *sepsis*, a diplococcus, a microbe, or some unknown morbific agent, and is not prepared as yet to accept as well established the theories of Koch, Pasteur, or Doléris. After summing up all the evidence *pro* and *con*, Dr. Smith writes:—

> "What shall we do then? Hold on to the good old way until we have something more palpably proved to shake us, and keep all our antiseptic precautions, before labor and after. If we have hospital patients, let them be in the hospital as short a time before labor as possible; but let the hospital be kept pure and disinfected; let cleanliness enter into everything; keep away all infection, erythematous, erysipelatous, everything that can taint an atmosphere. Turn the patient out of doors as much as possible. Use disinfectant baths, washes, injections, till labor comes on. Do not knowingly let any one touch the genitalia

without the most rigid purification, nail-brush, soap, and cloth applied to the arms up to the elbow, then soaking in disinfectants of a real virtue. I keep the vulva bathed constantly during the labor with a solution either of Labarraque, 1 part to 6 or 8 of water (good, fresh Labarraque), or bichloride of mercury, 1 to 1000. Unless there be something specially requiring the bichloride, I prefer the Labarraque, because I think the former hardens the tissues more and renders them liable to tear. I do not at all approve of the spray upon the genitalia; it wets the bed and clothing of the patient, requires her to lie in a constrained position, and if the obstetrician is going through any manipulation it wets him; and if carbolic acid is used, it paralyzes his skin so that he is almost helpless. The touch should be made with conscientious care; the hand never introduced without disinfecting thoroughly, and quite as thoroughly when withdrawn. I believe many a woman in long labor is poisoned, especially by the return to her vaginal cavity of a hand soiled half an hour before with her own healthy discharges, which had begun to decompose in the atmosphere of a warm room, upon the warm hand. If the hand is always cleaned as soon as removed there can be no danger of this. I think for cleansing the hand there can be nothing better than bichloride, 1 to 1000, and if I am a little doubtful about my hand I use it often, 1 to 250. It smarts a little, but that is much easier to bear than the loss of a human life. A towel, already soiled from previous use, if used again, may act in the same way."

"When the child is born and the placenta expelled, and especially if any intra-uterine manipulation has been used, my rule is to wash out the vaginal cavity certainly, and the uterine cavity if any evidence of clots in the uterus is present, or any decided patulousness of the os uteri. I do this with hot water at 115° Fahr., with bichloride, 1 to 1000. I have no fear of intra-uterine injections; if they are properly administered they can do no harm." . . . "The injection should be given with a tube with a return current, and then there can be no possible danger. The only portions of the coagula in the sinuses which could be disturbed would be those extending into the uterine cavity, and they had better be washed off at any rate. By using the proper tube, or making sure that the os uteri is patulous, no fluid can pass through the oviducts; but if it did, better that now than pus later; and the whole amount would not equal that entering the abdominal cavity from the sponge used in an abdominal section. As to the entrance of air into the veins, that is not at all a question with any careful operator; there should be no air in the syringe to pass into the veins." . . . "As to the chill that follows, it is a very rare thing comparatively, certainly not occurring in one case in one hundred altogether." . . . "I have never seen it at all attend the intra-uterine injection immediately after labor."

Dr. Smith has been in the habit of washing out the uterus a second time for the removal of coagula and the cure of persistent after-pains kept up by their presence. He has also done the same to rid the organ of decomposing and fetid matter, the presence of which is indicated by a rise of temperature, an accelerated pulse, with slight tenderness over the uterus, and with or without a secondary chill; using the bichloride of mercury solution at 100°. He also writes—

"If in any case the constitutional symptoms or the great fetidness of the lochia should continue, I repeat the washing out once or twice daily until they cease."

Dr. Smith also in ordinary cases directs the nurse to give vaginal injections of bichloride or carbolic solutions every six hours for the first two days, and with gradually diminishing frequency, until the lochia have ceased, and "the vulva is kept constantly bathed with antiseptic solutions, after cleansing with soap and water, and the frequent changing of the napkins."

We have let the President speak in his own words. One would suppose that he must have had some very unfortunate experiences in his own practice, which has been largely among the prominent and wealthy, to make him adopt such a line of precautionary measures as he has here recommended. Had the noted Dr. Rutter of this city (who met with forty-five cases of puerperal fever in his practice in one year, while his neighbor, Dr. Klapp, did not see one among two hundred parturient women) only adopted these frequent manual ablutions, his women might have escaped the poisoning effect of the muco-pus which he blew into his handkerchief and thus soiled his fingers. But then he and his colleague, Prof. C. D. Meigs, did not believe in the possibility of conveying the infection. Dr. Rutter at last appeared to think that possibly he might carry the poison from one to another in his clothes; but it does not appear that he ever discovered the *fons et origo mali;* for, after having 95 cases in Philadelphia, he located in Chicago, where he had a like experience with his patients.

Although Eve was told that she should bring forth children in sorrow, it has only been recently discovered that her parturition bordered so closely upon the pathological, that she was in danger also of being poisoned by her own lochia. We have always thought that giving birth to a child was a natural act, and that nature was fully competent to restore the woman to her former state if let alone after her delivery; but it seems that we must have been in error. We have known a physician, whose practice in obstetrics was quite extensive, and among the same classes in society as Dr. Smith's, who did not have a death among his parturient women for 30 years, either from the direct or secondary effects of labor, although he never irrigated either the uterus or vagina. But then he was very clean-handed, as he did not make autopsies, handle pathological specimens, practice abdominal surgery, or attend hospital patients; he was an obstetrician, but not a gynæcological surgeon. This we conceive to be the danger in heterogenetic poisoning. It was the resident surgeon who alternated with the physician of the Pennsylvania Hospital, in attending the cases of labor that carried the poison which produced the endemics that at times closed the lying-in wards: and the reviewer was able to trace the cause of the outbreak of 1845 directly to his surgical colleague, and indirectly to an outbreak of erysipelas in his wards.

The Almighty must have made his work in woman very incomplete, if it is required that she should have all that Dr. Smith teaches, done to her, to save her from autogenetic infection, arising from her decomposing lochia and blood-clots. She might well exclaim, save me also from the physician, if she knew how often his hands become soiled with septic matters, when engaged in surgical work, and in gynæcological practice. We believe in prophylactic and later ablutionary antiseptic measures in hospital practice, and in the value of uterine washing in septic poisoning actually present; but we cannot see the propriety of, or the necessity for, the general city or country practitioner's washing out the uteri of healthy women directly after labor. It is certain that wonderful success has attended the obstetric practice of men largely engaged in it, in this city, who never washed out a uterus, and who therefore cannot see the importance of doing it.

"*Moot-Points in regard to Inversion of the Uterus,*" is the title of an able paper contributed by Dr. J. C. Reeve, of Dayton, Ohio. The old, but still the prevalent idea with the unlearned, is, that uterine inversion is directly connected with parturition, that it follows immediately upon the delivery of the placenta, and that the fault of the accident lies with the physician in attendance. Fortunately for the obstetrician who may have the misfortune to fall into the hands of the law, there is being accumulated a mass of testimony in his defence, showing that such an accident may occur long after labor, after the woman is to all appearances well, and even where years have elapsed since the birth. This paper of Dr. Reeve presents many of the strange phenomena of this accident, and may have an importance in medico-legal investigations, and suits for malpractice in the future. We present the points of the article as follows:—

1. *Uterine Inversion independent of Pregnancy, or Polypus; also existing in the Nulliparous Organ.* Puzos, 1774, is given as the first authority to the effect, that nulliparous women, and others not pregnant for fifteen or twenty years, might become the subject of inversion. Madame Boivin held the same view, and attributed the accident to pressure upon an organ rendered soft by long-continued hemorrhage. Dr. Reeve cites four cases. The first was that of a girl of 15, who menstruated regularly for seven or eight months, and then had a habitual flow for a long period, when she came under the care of Baudelocque, who found an inverted uterus behind a hymen. The os could not be distinguished, and the inversion appeared to be complete. Baudelocque thought it must have been congenital. *Case* 2 was a large, portly woman of 44, mother of three children, the last one born 15 years before. The inversion appeared to have come on gradually with "a sense of discomfort and heaviness in the pelvis and a dragging, in the lumbar region, especially after walking or standing." Boyer recognized the condition from discovering the os tincæ, and found that blood exuded from the tumor during menstruation. *Case* 3 occurred to the late Dr. Willard Parker, who removed the uterus under a mistaken diagnosis. The woman was a young primipara, and seven or eight years had passed since her delivery. The accident occurred suddenly while making a violent effort in rolling a tenpin ball. She felt something give way within her, followed by intense pain, and became at once disabled.

2. "*Does Inversion of the Uterus always begin at the Fundus?*" This was long the universal opinion upon the mechanism of this accident, but since uteri have been found with a fundal depression, in some cases quite deep, and at the same time the evidences that the os tincæ still inclosed the inverted cervix, another view has also been held as to the initial step in the process. Dr. Reeve credits Tyler Smith with having been the first to advance the idea that the cervix may become inverted, while the body or fundus is still presenting upward into the pelvic cavity, as happens in intussusception and prolapsus ani. The cases in illustration are four, three of which have been given in an essay by Dr. Isaac E. Taylor. *Case* 1, by William Lawrence—woman, 33—had given birth to a child three years before, had always enjoyed good health, and only complained of a swelling in the privates. Tumor found protruding and as large as a fist, with a transverse fissure in the lower end. The os tincæ could not be felt but the union of vagina and cervix was distinctly marked. This protrusion had existed three months and was preceded for two more by a bearing down and uneasiness. Pressure upward with considerable force restored the organ. *Case* 2 was Dr. Taylor's own. The woman was a cook of 22, having an intact hymen. She had always enjoyed good health until her accident, which she attributed to carrying coal from the cellar. The fundal opening admitted a sound for three inches, and the measurement from the transverse orifice to the os tincæ was $1\frac{3}{4}$ in.; the whole mass was prolapsed. This patient was treated by position in bed and in $2\frac{1}{2}$ months entire reposition had taken place, with a sound measurement reduced to $2\frac{3}{4}$

inches. *Case* 3, by Dr. Ingleby. In this case the inversion occurred in a primipara, and was discovered on the eighth day after delivery; the body of the uterus was above the pelvic brim, and the os internum occupied the centre of the inversion, inclosing the tumor like a stricture. Pressure caused the stricture to give way in about five minutes, and reposition was found to have been effected. *Case* 4 occurred in the practice of Dr. A. Victoria Scott, the patient being known to the reviewer. The lady was not in good health, having suffered from chronic cystitis and leucorrhœa, and had aborted of a three months' fœtus, less than a year before. In the second pregnancy she again aborted at five months, and the os uteri remained very widely dilated. Through this, without any traction on the cord, the uterus became inverted, the cervical portion projecting beyond the fundus, and the os tincæ grasping the former, the mass protruding being much longer on the left than on the right side. Slight pressure caused the whole to become replaced with a jerk, as in the restoration of a caoutchouc ball after indentation. This woman has since then become the mother of two sons without any mishap.

3. "*Does Puerperal Inversion of the Uterus ever Occur except at or immediately after Delivery?*" This question has an important medico-legal bearing, as upon the answer rests the responsibility of the accoucheur in many cases. Was the uterus inverted at such a time that the accident should have been recognized and obviated by the attendant, or did it occur when he could not be held accountable for it?

Nine cases are quoted by the author upon this point. In Case 1, the symptoms indicate that inversion occurred after the patient was up, and the physician had ceased his attendance about two weeks, or twenty-five days after labor. In Case 2, the accident occurred at stool, two days after labor. In Case 3, the parturition was easy and natural, and the woman did well until after she was up, on the eighth day. Symptoms then arose which finally led to an examination, and inversion was discovered on the twenty-first day. In Case 4, inversion appears to have taken place at stool, on the eighth day. Case 5 arose from bed forty-eight hours after delivery, to have her bowels moved, and inversion resulted. Case 6 was examined on the sixth day, as she had once before had an inversion, and her uterus was found *in situ;* on the thirteenth day inversion again occurred. Case 7 was examined carefully at the close of labor, and uterus found firm and round; inversion found on seventh day. The remaining cases were to the same effect.

4. "*May Inversion of the Uterus take place without sufficient Symptoms to attract attention or to indicate that anything has gone wrong?*" Although the accident of inversion is usually indicated by alarming symptoms, and a large proportion may become rapidily fatal if not aided promptly, there have been cases where there was little change of countenance, no nervous distress, and no faintness. Two cases are cited in proof of this.

Dr. Reeve in closing, remarks: "The cases related show clearly that no aid can be relied on from the history of the case; an inversion of the uterus may have occurred at the last labor, and caused no symptoms of moment. The only safe clinical rule is to hold that a vaginal tumor may be an inverted uterus, whatever the condition or circumstances of the patient."

Dr. H. P. C. Wilson, of Baltimore, contributes a paper on "*Foreign Bodies left in the Abdomen after Laparotomy.*" This paper, with the additions made in its discussion, covers a record of 29 cases, 16 of them

European and the balance American. Mr. Tait reports ten cases where sponges were left. The remainder may be arranged as follows, viz., Sponge missed and removed, 5; Sponge discovered on autopsy, 9; Pair of forceps discovered on autopsy, 3; Sponge left and worked out in five months, 1; and forceps missed and removed, 1; total, 29.

In three cases a sponge had been torn without the knowledge of the operator, and thus the count failed to detect the oversight.

In Dr. Wilson's own case, the patient was five months pregnant when he removed an ovarian tumor, and left in a piece of sponge. The woman miscarried in eighteen days, and five months later the sponge was detected in an abscess and removed. The patient recovered and became more healthy than before she was taken sick. The loss of the sponge could not be accounted for.

Dr. T. Gaillard Thomas has a tag of tape, six inches long, attached to each of his sponges, as an additional safeguard against their being overlooked in the abdomen, and uses his hæmostatic forceps as short a time as possible. He believes that many more accidents than those collected have occurred.

"*Abdominal Section; its Value and Range of Application, as a means of Exploration and Treatment*," by C. D. PALMER, M.D., of Cincinnati. As it is the part of wisdom not to claim too infallible a diagnostic acumen in abdominal diseases, especially such as are dependent upon morbid growths, so it is also the part of candor to admit any errors that may have been committed in diagnosis, when such admissions may be used as profitable lessons by others who have entered the field of learning. Conferences held by medical men, whose positions as practitioners and operators enable them to recount their mishaps without fear, for the benefit of science, make statements which are often of more real practical value than those in which only the successes and triumphs of surgical treatment are narrated. No men of the present day seem more willing to give the benefit of their experience in failing to accomplish a purpose in operating, and the reasons therefore, than the gynæcological surgeon. Exploratory incisions as a means of positive diagnosis have really grown into favor in a few years, because of the discovery that such incised wounds were of much more positive value in the knowledge they gave in reference to the character of the morbid growth in question, than tapping, while at the same time they were, if anything, less dangerous than the latter. But how came this to be found out, and how did exploratory operations come to be considered proper and justifiable? Simply from the fact that such incisions were in general made under the intention of operating for the removal of something abnormal, which it was found could not be done with any hope of saving the patient, and that the said abandoned attempt was in a large proportion of cases recovered from. Exploratory incisions simply made as such, are rarely made, and yet a large proportion of the incisions through the linea alba are virtually tentative, the determination to complete the operation being contingent upon the correctness of a preconceived idea as to the nature of the growth to be removed, or the possibility of success in case of another form of disease being discovered. Thus, for example, we find that the first four extirpations of renal cysts on record were undertaken under the impression that the growths were ovarian.

Dr. Palmer recounts the diagnostic features, by which the characters of intra-abdominal growths are usually recognized, but at the same time shows their fallacious character, as evinced by errors of operators having a large experience. Like Lawson Tait, he is opposed to tapping as a means of diagnosis, and prefers the exploratory incision, which is certainly growing into favor, since, by numerous tests, its danger is found to be much less than was formerly thought. It must, however, be borne in mind, that in calculating the risks of exploration, cases should not be counted, in which any subsequent attempt at removal has been made and abandoned.

He says that judged by accumulated experiences—

> "tapping in a large proportion of cases in which it has usually been practised, is unnecessary, and superfluous for the purposes of diagnosis." "2d. That it is attended with such risks and dangers in its immediate and remote effects as to limit its employment to a minimum, only when absolutely necessary." "3d, That as the physical peculiarities of the fluids tapped, in point of color, odor, viscidity, and specific gravity, are not characteristic, nor the chemical product definite and unalterable, so the *microscopical evidences* as *interpreted* and *capable of being interpreted*, by *almost all observers and operators*, are *not positively trustworthy*."

Of rectal exploration he has little to say in favor, except that it has a theoretical value, which is outweighed by the risks in its practice. Such a means of exploration might be proper and of value under the tiny hand of Morisani, of Naples, but men of full size and stature have not his advantages in manual explorations, either vaginal or rectal.

The author's abdominal explorations are limited to five, in which he appears to have been more unfortunate in his results than in a number we have seen. The incisions varied from half an inch to four inches. No. 1, in a woman of fifty, was presumed to be ovarian, with ascites and probably malignant. It proved to be a malignant tumor of the mesentery. She died of exhaustion in three days. No. 2 was a malignant disease of the peritoneum, with ascites. Patient lived about a month. No. 3 had a malignant disease of the ovary with ascites. Was still living, but in very poor health, sixteen months later. The removal of the fluid caused her to improve in health for several months. No. 4 was over fifty, diagnosis confirmed, disease of omentum with ascites. Incision evacuated fluid and admitted the little finger; malignancy existed. Patient died in about a week. Case 5, in a boy of five years, cancer of mesentery with ascites. Death in seven days.

Mr. T. Spencer Wells had eighty-five exploratory operations with his one thousand ovariotomies, some of them were carried beyond exploration and then abandoned. Of these, thirty-three died.

Dr. Palmer enumerates the following, as the diseases calling for exploratory incision, viz., "*Ovarian tumors*," which are frequently complicated with pregnancy, ascites, peritonitis, malignant tumors, etc. 2. "*Certain interstitial and extra-uterine fibroids.*" 3. "*Certain cases of acute and chronic peritonitis.*" The incision is intended to be curative through cleansing and drainage. 4. "*Intestinal obstructions.*" The opening is here also intended for relief. He enumerates the agglutination of the ovarian stump to the intestines, adherent intestines, twisted intestines. 5. "*Chronic pelvic abscess.*" This may sometimes be evacuated with advantage through the abdominal wall. 6. Extra-uterine pregnancy." We cannot indorse the recommendation given, to perform primary laparotomy at term, if the child is alive, as there have been but two recoveries out of seventeen cases.

Dr. PAUL F. MUNDÉ, of New York, treats of "*Interstitial Cervical Fibroids as a cause of Dystocia, and their Removal by Vaginal Enucleation.*" He shows by the rarity of cervical fibroids, as evidenced by statistical records, that the neck of the uterus is an uncommon seat of this disease, while the body is quite the reverse; and that, consequently, the question of delivery where this growth is a serious obstruction, is one of the least common presented in parturition. Of the one hundred and thirty-seven cases in which the Cæsarean operation has been performed in the United States, only five were of the class of cervical fibromata, and but three of these are stated to have been interstitial. Eleven operations in all, in which the fibroids blocking the pelvis were uterine, resulted in saving three women and three children.

Fibroid tumors of the cervix have been at long intervals removed from women in labor by ligature and excision, during a period of more than a hundred and thirty years, but the operation by enucleation under similar circumstances is of comparatively recent date. Dr. Mundé gives a list of 9 cases, in 7 of which the latter method was adopted, to which he adds one of his own, and we add still another, making 9 enucleative cases, with the saving of 7 women and 2 children. One of the earliest of these operations was performed by Dr. Addinell Hewson (not mentioned in Mundé's list) of Philadelphia, in a case of labor under the care of Drs. Keating and Keller, on Feb. 14, 1858, and the woman was delivered later of a 9½ lb. fœtus, which was dead. After the delivery she had a violent flooding, but subsequently did well until the 16th, when puerperal fever of a phlebitic character set in, and death followed on the 21st, a week from the operation. The tumor was twenty inches in circumference and 2¾ pounds in weight. It was exhibited by Dr. Keating before the Philadelphia Pathological Society.

Dr. Mundé operated upon a patient in labor with a six months' fœtus on May 16, 1884, and removed a tumor weighing three pounds, the largest but one on record of fibroids enucleated during parturition. The woman made a good recovery, although much weakened by hemorrhagic and purulent discharges prior to the operation. The tumor was 8 inches long, 6 in breadth, 2½ inches antero-posteriorly, and 20½ in circumference. The Schroeder tumor (1882) was 6¼ inches long and 4¾ inches wide. The tumor in the Hewson case had escaped from the os uteri, but had a base of three inches in diameter. The Depaul tumor, which was sessile, and enucleated by the knife, weighed 3½ pounds. The woman lived two months.

There can be no question but that enucleation is the proper remedy in interstitial cases, but there are sub-peritoneal fibroids of the cervix and body, in which this operation is inadmissible. Where the tumor cannot be forced out of the pelvis, the next best operation is the Cæsarean section, as improved by Sänger, of Leipzig. The Porro method is not advisable, as has been shown recently by the difficulties encountered in the operation by Angus McDonald, of Edinburgh. The Cæsarean operation in fibroid cases has been very fatal, but there is no reason why it should be, to the extent recorded, but for the long delay usually made. There is now living in Indiana a farmer's wife who with her son nearly five years old, and both in good health, are trophies of the skill of Dr. Moses Baker, who delivered her by the Cæsarean section in Nov. 1880. Dr. Sänger[1] collected in 1882, a list of 43 so-called Kaiserschnitts, in which uterine fibromas were the obstacles to delivery, with a loss of 35 women and 28 children, but has mixed in his record true Cæsarean operation, Porro-Cæsarean, and laparotomies after ruptured uterus. Dr. Mundé has done service to the profession by calling attention to the method and promise of enucleation, as shown in his own and a few similar cases.

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[1] Der Kaiserschnitt Bei Uterusfibromen.

In the discussion which followed the reading of the paper, Dr. E. W. Jenks, of Detroit, added a tenth case of enucleation, which was operated on by him with success during labor, the tumor being small; and Dr. T. A. Reamy, of Cincinnati, an eleventh, saving mother and child. Dr. Byford was in favor of enucleating during labor and not earlier, as there was a danger of losing the fœtus by miscarriage, and tumors were crushed and forced out during the expulsion of the fœtal head. He had seen two such cases which terminated favorably, in one of which the tumor weighed 18 ounces, and the other he thought quite as large or nearly so, as Dr. Mundé's. He enucleated the second outside of the vulva, a portion of the cervix protruding.

Dr. T. Gaillard Thomas reports *six additional cases of extra-uterine pregnancy.* These with twenty-one previously reported make 27 cases in the experience of the writer, which under the calculation of Bandl, of Vienna, would represent between 300,000 and 400,000 gynæcological and obstetrical cases. Nearly all of the cases were seen in consultation.

CASE 22.—Patient 27, a nullipara, married ten years, ceased to menstruate 4 months before. A Fallopian cyst presumed to have given way in the fourth week from a jerk and twist received by a car moving as she stepped from it. Was very ill afterward, with symptoms of pelvic peritonitis. Pelvis found filled with an undefinable mass. Aspirator used, and f℥iv fluid, like liquor amnii, removed. Violent pain set in and death resulted in twelve hours. A fœtus of 4 months was found in the Douglas pouch, and the abdominal viscera were matted together and covered with thick deposits of lymph.

CASE 23.—Woman 32, also nulliparous, and married seven years. Fœtus believed to have escaped into the abdominal cavity by rupture of the cyst. A double-cell faradic battery used, with one electrode in the rectum and another over the tumor, the current being passed for five successive days, night and morning, and of sufficient strength to cause decided contractions of the abdominal muscles. Patient, after having been dangerously affected, entirely regained her health in a few months.

CASE 24.—Woman also nulliparous, married eighteen months. A galvanic current used from 20 cells, interrupted 60 times a minute for 4 minutes, and then passed continuously for five minutes under ether. Tumor which was as large as two fists gradually diminished in size, pains became less frequent and violent, and she finally recovered.

CASE 25.—Woman nulliparous, 4 months pregnant, tumor in Douglas pouch; galvanic current employed; marked change in 48 hours, returned home in ten days, a small hard nodule the size of a hen's egg finally remained. Patient entirely restored to health.

CASE 26.—Woman 28, five feet high, 155 pounds weight, rupture of Fallopian cyst, laparotomy with exsection of fœtal mass performed by Dr. Briddon. Patient died of shock in 47 hours.

CASE 27.—Woman 23; mother of a child 4 years old. Extra-uterine fœtus diagnosed at 9 months after quasi-labor and death of child. Waited three months, then performed secondary laparotomy. Placenta unusually large, and attached to colon from caput coli to sigmoid flexure. After sewing attachment with cobbler's stitch, removed 4 lbs. of placenta, and puckered in the balance into the abdominal wound. Violent acute septicæmia set in in 24 hours, with pulse 150, and temperature 104.4°. Woman recovered in six weeks.

This was the fourth secondary laparotomy with recovery performed by Dr. Thomas, who limits the use of electricity now to about 4½ months. If the pregnancy is more advanced, he proposes to perform primary laparotomy and save the child at maturity. We wish him success when he makes the test of his theory, but he must remember that but two cases out of seventeen have recovered, and that extra-uterine fœtuses are often imperfect in formation. This was the case in one of the two deliveries which were not fatal, the fœtus having flat feet and an encephalocele.

The Proper Limitation of the Operation of Complete Vaginal Hysterectomy for Cancer of the Uterus is presented by Dr. PAUL F. MUNDÉ, of New York, who is opposed to the abdominal operation of Freund, on account of its great mortality, but is an advocate for extirpation by the vagina in the early stages of cancer, where the uterus is mobile, the vagina not too small, and the parts contiguous to the organ not involved; the object being to remove the entire disease in its local stage (*if it is ever purely local*), and thus not only relieve suffering, and prolong life, but entirely cure the patient. He gives an excellent description of the steps of the operation as learned by two tests upon the living, and reports his first and second cases of extirpation, dating since the last meeting of the society. He is opposed to all operations of removal where there are any evidences of constitutional taint, as shown by enlargement of glands, indurations, or otherwise. His first case, tested by the eye, showed no extension of disease to the parametrium, but a microscopical expert detected after the removal cancer elements therein, and foretold a return in two years. This condition did not prevent perfect union, an apparent restoration to health, and an appearance of soundness in the contiguous tissues. But at the end of nine months, having been carefully inspected every four to six weeks in the interval, there appeared "a slight induration in the left half of the cicatrix," and in 10 months and 16 days from the operation the record shows that there was "a cavity of the size of a fifty-cent piece, and an inch in depth, extending up into the cellular tissue under the stump of the left broad ligament." As the uterus and ovaries exsected weighed 7½ ozs., the involvement of parametrium is not surprising. The patient was 43, and a ten-para, with an ample vagina; the wound was closed with twenty silk sutures, and was practically healed on the sixteenth day.

The second operation was much more difficult, being performed on a woman of 30, and mother of one child, six years old, the vagina giving much less working space. The parametrium appeared healthy, no sign of infiltration felt by vagina or rectum. Operation after same method as before, on November 9, 1883; securing of arteries very difficult, from narrowness of vagina, and two that bled were hidden for a time under the speculum. Time of operation two hours. Pulse ran up in the night to 120; temperature rose to 103°, 104° F., and at the end of 40 hours, to 107.2° F., when she died.

As the results of the removal of the uterus, Dr. Mundé states that the record of Schroeder shows 129 operations for cancer in 8 years, with 28 cases remaining well after two years, and 24 after 2½ years. He also gives a table of 82 cases of removal, all by the vaginal operation, with a recurrence in 47, dating from 2 months to 2½ years. There were 32 well after two years had passed.

As to the immediate danger of this mode of operating, he gives a tabular record of 255 cases with 72 deaths, the American portion being 21, with 10 deaths; per centage of the whole 28.23. Where the cancer is confined to the cervix (if this can be positively determined), Dr. Mundé thinks that the whole organ should not be removed, but the neck excised.

The reading of this paper provoked a discussion, the record of which fills sixteen pages of the Transactions. The general opinion was in favor of the operation under the limitations given. We do not regard the statistics yet taken as sufficiently minute. Given 100 cases (all recorded), how many have died directly from the operation; how many within a month; how many within six months, a year, two years, and three years, etc.? What is the average time between discovery and death in a series of cases not excised? When all of the operations are searched out and published, as the Porro operations have been in order, by the reviewer, Dr. Godson and Dr. Truzzi, it will be a simple matter to defend or condemn the vaginal exsection of the uterus as a means for curing cancer; as yet the operation is too young to establish a claim for success. There are old surgeons in our country, who after removing hundreds of cancerous mammæ, are satisfied that women who are not operated upon live longer on the average than those who are, and they decline to operate, where they think the advice will be heeded. Cancers have been removed from the breast, as soon as discovered, when very small and painless, under a fear of future trouble, when the character of the growth should be demonstrated symptomatically, and their removal has not prevented the return of the disease in a more decided character.

Dr. Edward Warren Sawyer, of Chicago, offers some "*Remarks on the Occipito-Posterior position in Vertex Labors, with an Analysis of Thirty-eight Cases.* He claims to have had these 38 cases in 183 presentations of the vertex: how many were seen in consultation he does not state. This number, according to Madame Boivin, would represent about 3400 vertex labors. This excessive proportion is certainly not in accordance with the ordinary experience of accoucheurs. Dr. Sawyer differs in opinion from most obstetrical writers in saying, "that when the occiput engages in the excavation in a posterior position, it persists in remaining, and is delivered in this position if no interference is made. Further, that it is the greatest rarity that the occiput rotates forward into the anterior half of the pelvis." In but two of the cases did such unaided rotation occur; the reason for this was, that assistance was given before the head had descended far enough.

The long forceps were used in 28 of the labors, short forceps in 3, Tarnier's in 4 (in 2 after rotation with hand in vagina), and Simpson's in one after manual rotation. Two women were lost, one from shock in 24 hours, and one from cardiac thrombosis in 4 hours. 32 children were delivered alive, and 28 were still living at the end of three days.

The views of the author met with much opposition, especially those adverse to the teachings ordinarily given in text-books upon the forward rotation in occipito-posterior positions: his early interference for the sake of the mother and fœtus were heartily concurred in.

Dr. Thadeus A. Reamy remarked:—

> "Spontaneous rotation occurs when the presenting part has been pressed forward by the forward curve of the sacrum, which is unyielding, and when it can

no longer descend it is pressed forward. The curvature of the frontal bone glides up on the left, because the head cannot descend farther unless it so advances, and when it does ascend the left lateral inclined plane of the pelvis, the resistance offered by the pubic bone makes it imperative that it redescend, and so rotation occurs. I have repeatedly kept my position at the bedside, with my finger upon the presenting part, and watched this rotation; I have done it in more than twenty cases, and I am satisfied that it does occur, and that it does occur at this point."

Dr. A. H. Smith quoted Nägele to the effect that in only 17 cases out 1247 occipito-posterior positions did the head of the child fail to emerge, with the occiput under the pubic arch, and stated his belief that where it did not do this, either the head was proportionately small, or there was some other condition that acted as a preventive.

"*Insidious Septicæmia. A Rare, Deceptive, and Fatal Form of the Disease.*" Dr. George J. **Engelmann**, of St. Louis, remarks of the acter of this type of disease:—

"The very symptoms which are so common as to be among the first and most prominent indications of every disease, *fever* and *pain*, are the very ones most usually wanting; sometimes it is one, sometimes another, *the degree of danger being in inverse ratio to the intensity of symptoms*. The symptoms which do appear are certainly very much at variance with those ordinarily accepted as characteristic of septic poisoning; the absence of symptoms and the fatal result characterize this form of septicæmia and pyæmia. The disease may be of auto- or hetero-infection; it may begin with a chill or not. The most dangerous and invariably fatal cases are those in which all or a great number of symptoms are wanting; though I may say that all symptoms are rarely absent in one and the same case."

The characteristic marks of disease mentioned, are "a state of perfect contentment and well-being; the patient is satisfied with her condition; but also satisfied to be in bed." Another almost invariable symptom is—

"a slight looseness of the bowels, which will hardly be noticed, as it is not sufficient to attract the attention of the family or the practitioner. It is not diarrhœa, but rather a soft natural stool, perhaps not more than once or twice a day, wanting in all the characteristics of septic diarrhœa, without the foul odor which usually accompanies the latter. The symptoms most commonly absent are pain and elevation of temperature. The pulse is sometimes accelerated, but may be perfectly natural."

"The disease rarely begins with a marked chill; more commonly there is a chilly sensation, a feeling of discomfort with some little fever, such as might be indicative of a trifling ailment; and this first calls attention to the existence of some morbid condition; but these symptoms soon pass away, the anxiety of friends and physician is relieved; the patient is comfortable, quiet, but without ambition, perfectly content with her condition, supposed by all to be on the high road to recovery. In this state she remains, frequently without desire for nourishment, but, it seems, from a natural want of appetite; always feeling well, but slowly sinking until she passes away, only at times with violent symptoms at the last; more commonly comatose than in convolutions."

In the latter stages the temperature is liable to be subnormal, and there is no burning heat of skin.

Five cases are reported as examples, two of which are puerperal. *Case IV* was that of a primipara of 23, who died eight days after delivery, having during the last four days a temperature of 97.8° to 98.5° F., although her pulse ran from 124 to 128. Her abdomen was found distended with pus. In the early stage of her attack she had a violent chill, after which her pulse ran up to 140, and temperature to 103.2° F. This introduction prevented Dr. Engelmann from being encouraged by the subsidence of pain and heat.

Case V was reported to the author as one of unaccountable death after labor. The patient was a 2-para of 25, and died at about the same time after her delivery, as Case IV. In her the abdomen was soft and not sensitive, lochial discharge slight—perspiration free but not offensive—and she expressed herself as "all right and comfortable." No autopsy was made.

Dr. W. L. Richardson had met with five or six of this class of cases, and had verified his diagnosis by autopsy. Dr. T. A. Reamy spoke of having also seen several, the main feature being absence of pain, and in some there was no acceleration of the pulse. Mental anxiety in the puerperal cases was a noticeable feature.

Dr. William T. Lusk, of New York, presents "*A Note on the Ring of Bandl.*" From having been a believer in the statement of Bandl, of Vienna, that the upper part of the cervix uteri expanded so as to form a part of the sac for the fœtus as it neared maturity, and that the cervico-uterine limit was marked by a distinct ring, which has been called after his name, Dr. Lusk has been led by three carefully made autopsies in the cases of women who died in the last month of gestation, to abandon this belief and to teach quite the contrary. The following is a short note of what was found in each subject:—

Case 1. Coroner's examination; woman a primipara; no history; cervix found hypertrophied, and exceeded 4.5 cm. ($1\frac{3}{4}$ inches) in length; the plug of mucus terminated at the upper orifice, "and the membranes adhered closely to the lower segment and to the borders of the internal orifice." A most careful examination made by him and Prof. Wm. H. Welch "failed to discover the slightest trace of a second ring. The walls of the lower uterine segment were possibly a trifle thinner than those of the body, but there was no indication at any point of any appreciable change in either the mucous membrane or the muscular structure of the uterine walls."

Case 2. Also coroner's examination; woman a multipara; measurement of cervix and appearances the same as in Case 1.

Case 3. June, 1884. 12-para; died in the last week of gestation; cervix also $1\frac{3}{4}$ inches long; internal orifice closed; mucous plug ended at the termination of the canal; membranes found adherent to the borders of the internal orifice. Drs. Lusk and Janeway failed to find anything corresponding to the so-called ring of Bandl.

Dr. Lusk proposes in view of the above to abandon the terms "ring of Bandl" and "ring of Müller" and return to the more correct one of "os internum" "as expressing the true upper limit of the cervical canal."

Such very contrary opinions have been given after autopsies in different countries, that we are led to believe there is something in nationality and mode of living. No doubt Dr. Lusk is correct here, but may there not be different changes in countries where displaced kidneys and attenuated uteri are not uncommon in hard-worked multiparæ, especially of the peasant class?

"*The Non-Malignant Tumors of the Uterus, their Pathology, Diagnosis and Treatment,*" is the title of a paper by Dr. R. Stansbury Sutton, of Pittsburgh. We cannot do justice to this paper of seventy pages by any form of abstract. Dr. Sutton writes from personal experiences obtained by his own operations, and from observations made during a long visit in Europe where he saw those of many of the most noted gynæcological surgeons of Great Britain and upon the Continent. He commences with the bibliography of his subject; notes the microscopical characteristics of benign tumors of the uterus; their peculiar appearances, density, etc., under the eye and touch; the methods of examining suspected patients; the best means of securing a differential diagnosis; and the most approved methods of treatment to establish a cure. The diseases treated of are fibro-myomata; divided into sub-peritoneal, interstitial, and sub-mucous, with the changes effected by fatty degeneration, myxomatous degeneration, calcification, cystic degeneration, induration, and suppuration. These are subdivided into growths affecting 1. The body of the uterus. 2. The cervix. We have read this paper with much interest, and commend it for its simplicity, clearness, and thoroughness, in treating of the class of cases once so fatal; always of interest from their dangerous character; and of later years especially so because of the wonderful progress made in their removal and cure under the knife; and because of the discovery of the arrested development and subsequent atrophic destruction of one variety, the interstitial, effected by the removal of the ovaries and Fallopian tubes, as inaugurated by Mr. Lawson Tait, on Feb. 11th, 1872.

"*The Clamp Suture and the Range of its Applicability, considered in Relation to the Cure of the Injuries incident to Parturition, with Statistics.*" Dr. NATHAN BOZEMAN, of New York, in an illustrated paper of 58 pages, shows the defects of the clamp suture of Dr. J. Marion Sims, in the treatment of vesico-vaginal fistulæ, and the superior character of the button suture designed by himself to obviate the deficiencies of the former, and with which he cured some of the cases in which the clamp suture had failed, after several trials. The paper was written partly in his own defence, and partly to establish his claim of originality in having designed the button suture and the preparative plan employed in anticipation of the operation for finally closing the fistulæ.

This volume under review is one of the most creditable of the series issued by the society. It contains a phototype of the late Dr. James D. Trask, and a fine engraving of the late Dr. J. Marion Sims, with an obituary notice prepared under appointment by Dr. Ely Van De Warker, of Syracuse, New York. R. P. H.

ART. XX.—*Diseases of the Tongue.* By HENRY T. BUTLIN, F.R.C.S., Assistant Surgeon and Demonstrator of Practical Surgery and Diseases of the Larynx, St. Bartholomew's Hospital, lately Erasmus Wilson Professor of Pathology at the Royal College of Surgeons. Illustrated with chromo-lithographs and engravings. Philadelphia: Lea Brothers & Co., 1885. Small 8vo., pp. 445. One of the "Clinical Manuals for Practitioners and Students of Medicine."

EVERY page written by so well known an author as Mr. Butlin is worthy of careful study although we may not assent to all his propositions. Such study is especially demanded for a work like the present, which seems to us both a welcome and important contribution to our knowledge of a subject which has been too much neglected. It is true, that attention has been of late paid to the study of a series of affections which too often terminate in carcinoma linguæ, but these contributions are widely scattered throughout periodical literature, and nowhere heretofore could the student obtain the requisite information in a compact form. We do not say that most of the facts contained in this manual are not attainable, but no one, after glancing over the dozen pages of the mere bibliography of diseases of the tongue, will doubt that few would be equal to the task. This latter feature of the work is a most useful addendum.

Mr. Butlin, in his preface, unconsciously gives us one of the best guarantees possible that his work will be of value, when he says, that he has used his opportunities for years past in the out-patient practice of St. Bartholomew's in collecting notes and drawings of diseases of the tongue, "at first" without "any definite intention of publishing them, and certainly not with any intention of writing a book on *Diseases of the Tongue.*" In other words, cases were noted and opinions formed from experience with no view of making them fit into new, preconceived, or extended theories calculated to form the foundation of a special treatise. Nearly all the admirable chromo-lithographs which really *illustrate* this book are of cases which have been under the author's own care, a few only being taken from patients in the service of his colleagues. The author is to be congratulated upon the liberality of the publishers in allowing his drawings to be most artistically reproduced; we have rarely seen better ones.

In an introductory chapter Mr. Butlin rather unnecessarily explains at length his reasons for adopting the arrangement of his subject matter, which is partly encyclopædic, partly dictated by convenience. Burns, scalds, stings, bites, wounds, and foreign bodies in the tongue, are considered in the second chapter. A concise account is given of the effects produced upon the tongue by the various corrosive poisons, which is supplemented by a table at the end of Chapter IV. on "tinctorial discolorations and stains from caustics," which is a modification of that of Rigal. In all hemorrhages, other than those due to the presence of foreign bodies, the flow should be arrested *thoroughly* and as soon as possible. When the wound is far forward, this arrest should not be difficult, but Mr. Butlin advises that anæsthesia and a gag be used, and full control be obtained of the tongue by two threads passed through either side of its tip; meanwhile the pressure of a pad of lint and the finger will temporarily suffice. If the bleeding be capillary or venous, coaptation by deep-sutures after the removal of all clots will suffice; if arterial, the vessel must be sought for and secured, the wound being unhesitatingly enlarged if necessary. In doing this, it must be remembered that if the bleeding be arterial the wound must be a deep one and the incisions accordingly profound. If these rather elaborate measures cannot be adopted owing to lack of assistance, digital pressure on a small piece of lint lodged in the deepest part of the wound must be resorted to, until proper assistance is attainable. Ligature of the lingual artery for primary hemorrhage is probably never demanded. Secondary hemorrhage must be treated on the same lines, but failure to secure the vessel in the wound may necessitate ligature of the lingual or even the external or common carotid; the latter, when the wound involves the tonsil or adjacent structures.

Sutures, other than for the arrest of capillary or venous hemorrhage, are only required when the parts do not lie naturally in apposition, or where a segment of the tongue is almost separated; they should be passed deeply, the best material being stout silk, and in the case of children the operation may require anæsthesia. If seen later, paring of the edges and sutures are advised where the apposition is not good. Foreign bodies should be at once sought for and removed. A slight attack of secondary hemorrhage, a few days after the receipt of a wound, should at once excite the suspicion of the presence of a foreign body. If a wound, especially a punctured one, does not heal within a reasonable time and remain so, a foreign body should be suspected and sought for; this is all the more imperative, if an indolent tumor remain with a sinus leading down to it. It should not be forgotten that while the removal of foreign bodies usually terminates satisfactorily, yet occasionally severe and even fatal hemorrhage, due to wounds of the large vessels, has followed their withdrawal. Absence of the tongue, only one genuine case being on record, and bifid tongue, probably due to the dragging of a "too short frænum," we think are rather too elaborately discussed in the third chapter. Adherent tongue and its cure is spoken of. Division of the frænum for tongue-tie should not be done "if the fingers can be placed beneath the tip of the tongue, and if the tongue can be protruded so that the tip appears beyond the teeth." Tongue-swallowing is shown to be due to congenital elongation of the frænum or to a too free division of a contracted one. The condition is a very rare one, and should be treated by the introduction of the finger far back in the throat so as to draw the tongue forwards, and by prevention, *i. e.*, the substitution of the finger or nipple, natural or artificial, whenever the infant seems inclined to suck back its tongue. The occurrence of threatened attacks of suffocation in infants should at once cause the attendant to examine the condition of the tongue, as *perhaps* this rare abnormality may be the cause. A special chapter is devoted to discolorations of the tongue to which we must refer the reader who desires information. Acute glossitis is thought to be a catarrhal affection and is to be treated accordingly. Acute œdematous swellings of the buccal floor, acute ranula, etc., may give rise to some difficulty in the diagnosis of this affection. The description and treatment of glossitis, hemi-glossitis, lingual quinsy, mercurial glossitis, and gangrene contains much of interest, but we cannot do more than mention the fact.

Eruptions on the tongue, indentations, excoriations, furrows, grooves, wrinkles, fissures, and clefts, are well, but somewhat too minutely, described. Syphilis is shown to be the commonest cause of fissures and clefts, of which conditions two striking colored drawings are given. We shall revert to this subject later. Owing to the soft and delicate structure of its mucous membrane, the tongue is especially prone to ulceration. "With the exception of syphilitic gummatous ulcers, and, perhaps, of some or all of those which are tuberculous, all the ulcers of the tongue are, *primarily*, diseases of the mucous membrane." Ulcers are considered under the heads of simple, *i. e.*, those which cannot be ascribed to any definite or clearly ascertainable cause, traumatic, apthous, cancerous, tuberculous, syphilitic, and mercurial. It would be impossible, without exceeding legitimate limits, to give the author's treatment for all these conditions specifically, suffice it to say that his advice as to diet, drugs, etc., is eminently judicious and marked by an absence of any advocacy of personal or pet remedies; thus he says :—

> "In practice I have sometimes found that the particular remedy which I thought applicable to a certain tongue, suited it far less well than another remedy

> which *a priori* might have seemed unsuitable. I am therefore in the habit of employing first the remedy which seems most likely to be useful, the soothing remedies to the most irritable ulcers, the astringent to the chronic and less sensitive sores, and, if relief is not quickly afforded, of changing the local remedy until the desired effect is produced."

Solutions of chromic acid are highly thought of. Iodide of potassium in chronic glossitis of undoubted spyhilitic origin sometimes only increases the evil. Mr. Butlin has found, where the tongue trouble is associated with palmar eczema, or if other parts of the body are similarly affected, arsenic is decidedly beneficial. Even a mercurial purge should not be administered to children suffering from aphthous ulceration, owing to the possible risk of inducing gangrenous stomatitis. Speaking of traumatic ulcers, the author, while admitting that the more active of those produced by jagged teeth, etc., are largely attributable to the patient's general condition, denies that the more chronic and indolent are in any great measure dependent on the patient's health. We cannot here enter into the question of diagnosis, preferring to reserve our remarks for the chapter on carcinoma. The removal of all sources of irritation usually suffices for cure, but in chronic cases, especially in those over forty years of age, if the ulcer does not rapidly improve when the source of irritation has been removed, an excision, which includes about a quarter of an inch of the surrounding healthy tissues, is advocated, lest a mistake has been made, and the disease is really, or is becoming, carcinomatous.

The author thinks that there is not sufficient evidence to prove that the lung affection, which almost invariably terminates life in primary tuberculous ulcers of the tongue which are not operated upon, is due to contagious materials reaching the lungs; but the "probability that secondary tuberculous ulcers of the tongue are due to inoculation from tuberculous affection of the lung and larynx is much greater." In view of the facts that a primary ulcer *may* prove a source of infection, and that the disease is invariably fatal and the patient's life is rendered miserable while it does last, Mr. Butlin strongly advocates early and free excision. A small secondary tuberculous ulcer, "if the associated disease is not advanced, and the operation is likely to be well borne," should also be removed. Where only palliation is possible, much good advice is given as to food, etc., soothing alkaline or slightly astringent solutions are recommended, and the application to the carefully dried surface of the ulcer of the following powder is advised: Finely-powdered iodoform gr. j, morphia sulph. gr. $\frac{1}{6}$ to gr. $\frac{1}{2}$, sodæ biborat. gr. iij. The powder should be blown through a glass tube or dusted thickly over the dried surface of the ulcer three to four times daily, according to the effects produced; of course the amount of morphia must be varied to suit circumstances. Speaking of syphilitic ulcers, we can only mention a few of the many important points made by the author. Thus as to diagnosis he says, "the diagnosis is in most instances easy, in some instances impossible." . . . . "The entire absence, or the very modified character of the surrounding inflammation, may be almost termed a sign of syphilis." In most cases for a rapid cure, both local and constitutional measures must be used. Mr. Butlin says:—

> "I have treated these patients with mercury for several months in succession without curing or greatly altering the sore places on their tongues. With the mercury I have then employed local treatment, and have seen the sores disappear within a week. Again, I have treated other patients with the same local

measures from the commencement, and have cured the sores within a week or ten days. On this account I look on local treatment as essential to the rapid cure of these affections."

The local treatment found most useful is chromic acid grs. x, aquæ f℥j, painted over the sore three to four times daily.

Tertiary ulcers result either from the breaking of large, deep gummata, or from a similar change affecting many smaller superficial ones. These latter form "irregular lines on the dorsum, hardly recognizable as gummata on account of their small size and close neighborhood to one another. They are more like hard and knotted cords in or immediately beneath the mucous membrane." Ulcers resulting from this latter form of deposit "may form long lines or fissures, more or less deep, running for the most part in a longitudinal direction, often sinuous and branched." . . . . "The diagnosis of the linear ulcers and fissures, when they are extensive and numerous, and especially when they are deep, is certain." . . . . "A single deep fissure may be due to tubercle or perhaps even to carcinoma; but the ploughed-up dorsum, such as one sees in old cases of syphilis, has no counterpart in any other disease." The chapter on "smoker's patch," leucoma or leucoplakia, ichthyosis, chronic superficial glossitis, ring-worm or wandering rash, mucous patches, tertiary syphilitic plaques, lichen, diphtheria, and leprosy of the tongue, is most interesting and profitable reading. Mr. Butlin contends that leucoma—under which term he includes smoker's patches, leucoplakia, psoriasis, tylosis, plaques opaline, etc.—occurs in several forms which are not necessarily directly connected with one another. "They are not all of them different stages of the same form of disease, although they all probably own one common cause." Tobacco is acknowledged to be *one* cause of leucoma, but neither the only nor a certain one, many smokers never having it, while it is not uncommon in persons who do not use tobacco. Other exciting causes are syphilis, frequent use of undiluted spirits, the taking of very hot and highly spiced meats or drinks, and the friction of rough artificial teeth-plates, etc.

The author agrees with Debove in thinking that there must also be some predisposing cause. This predisposition, Mr. Butlin thinks, consists in a peculiar thinness and instability of the mucous membrane, rendering it more easily irritated than in most persons, a condition analogous to that of those with delicate and irritable skins. Age and sex are also decidedly predisposing causes, for leucoma occurs far more frequently in men than in women, and is almost unknown in patients under twenty years, and almost as rarely commences in those over sixty. Not only the tongue, but the cheeks and inside of the lips suffer. The disease in exceptional cases attacks the gums and palate, while in one instance the female genitals were affected. As to recovery the author does not deny its possibility in confirmed cases, but much doubts its probability. We have dwelt thus particularly on the subject of leucoma because of its being an undoubted predisposing cause of lingual carcinoma, and Mr. Butlin thinks that this frequency, instead of having been exaggerated, has been rather underrated.

The different views held concerning the pathology of leucoma are discussed, and the author declares that he, with the majority of observers, is inclined to consider it a mild chronic inflammation of the mucous membrane.

As to curative treatment, the author, believing that confirmed cases are incurable, advises only palliation, *i. e.*, the removal as far as possible of the conditions which seem to have produced the disease, the use of alkaline washes, and *perhaps* the removal of very thick and circumscribed patches. Indurations, warty growths, and very obstinate ulcers occurring in or upon such tongues should undoubtedly be early and most freely excised. In limited ichthyosis early free excision is recommended. Chronic superficial glossitis is next considered, and is thought not to be "more amenable to treatment than leucoma or ichthyosis" . . . and that "it may be the precursor and predisposing cause of lingual carcinoma, and that warty growths, indurations, and indolent ulcers which become indurated are to be regarded as in the highest degree suspicious, and to be treated on the assumption that they are cancerous if they do not quickly yield to simple treatment." Many pages are devoted to the consideration of so-called "ring-worm," or, as Mr. Butlin prefers to call it, "wandering rash." As it is practically uninfluenced by remedies, and is almost invariably a trivial affection, we think this a waste of space.

Mucous patches, which are elaborately considered, are stated to be no longer "bugbears," as far as treatment goes, since they rapidly yield to the application of a ten-grain solution of chromic acid, although all local sources of irritation must be removed, as a carious tooth for instance, and internal treatment likewise employed. Tertiary syphilitic plaques are carefully described by means of two illustrative cases, which will hardly bear abstracting, and an extended commentary. As this is an affection scarcely mentioned in works on syphilis or the tongue, the reader would do well to consult Mr. Butlin's account. For the interesting description of nodes—dental, tubercular, and syphilitic—the reader is referred to the original. Mercury is only serviceable in gummata when the patient cannot take iodide of potassium, or in those where the gumma has appeared early in the course of syphilis. Smooth patches, smooth tongues, atrophy, hemi-atrophy and hypertrophy are next considered. While interesting, the accounts of these conditions do not call for any special comment. The same remarks are applicable to the author's treatment of the following affections, viz., mucous cysts, blood-cysts, cysticercus cellulosæ, echinococcus, chronic abscess, ranula, dermoid cysts, and salivary calculus. We are rather surprised to find nothing said of certain of the bursæ, which may possibly present as tumors involving the tongue.

The chapter on innocent growths is excellent, and the only points requiring emphasis are "that the treatment of larger or doubtful warts in persons over forty years of age by caustics" . . . "cannot be too strongly deprecated;" and that it is well worth our while to try antisyphilitic remedies, and painting freely with a solution of chromic acid in cases even without a specific history, since such treatment has resulted in a cure in apparently non-specific cases.

The author now unreservedly admits that sarcoma of the tongue may occur, and relates two cases in addition to that of Jacobi's. Mr. Butlin denies that any other form of carcinoma than epithelioma occurs in the tongue. No part of the organ is exempt, although in most cases the sides are attacked. Age is a predisposing cause, since youth is absolutely exempt, "and the disease is so rare before the age of thirty years that the same statement might almost be made with regard to young adult life." Sex exerts a marked influence, since it occurs nearly six times oftener in males than females. This is probably due to the different habits as to smoking, drinking, etc., of the sexes. Syphilis, by producing superficial inflammation, and by the scars left by old ulcerations along the borders of the tongue, predisposes to the after-occurrence of carcinoma. "But the ulcers and scars produced by syphilis are not more prone to become cancerous than the scars which are due to any other causes." The author thinks that too much has been made of inheritance as a predisposing cause of carcinoma, and that "if the theory of the inheritance of cancer rested on the family histories of persons with carcinoma of the tongue, it would soon cease to be accepted." Although a tolerably acute ulcer may be soon converted into a cancerous ulcer, this is the exception; the chronic, indolent sores which are irritated by carious teeth, spirit drinking, and above all, caustics, are those which take on malignant action. We here quote the italicized words of the author, since the point is of so much importance that it cannot be over-estimated: "*If there be one thing more harmful than another in the treatment of simple indolent ulcers of the tongue in persons over thirty years of age, it is the application of a strong caustic.*" Such applications in children or youths are useful, but when the carcinomatous age, so to speak, is reached, milder remedies should be resorted to.

The very different initial aspects of carcinoma of the tongue are not due to variations in the disease, but, as the author points out, to the engrafting of the malignant change upon such different conditions as the various chronic ulcers, fissures, old scars, and leucoma of the tongue. An enlargement of one of the glands beneath the jaw at an early stage of carcinoma, which has attacked a chronic ulcer, does not necessarily imply that the gland is carcinomatous; it may be simply irritated. The only pathological points of interest which the author brings out are, that none other than squamous-celled epithelioma has been ever proved to occur on the tongue, and that from the peculiar picture presented by microscopic sections the development of the ingrowing pegs of epithelium seems to occur "within or at least follows the route of the lingual lymphatics." This is of course not new, but goes to explain the comparatively early period at which the lymphatic glands are affected in cancer of the tongue. Mr. Butlin says that the examinations which he has made of old inflamed, scarred tongues, "even when they are apparently most healthy," reveals a possible explanation of the proneness of such tongues to become carcinomatous; for the "epithelium is found to be unequal in size, irregular in shape, containing vacuoles and larger nuclei than natural, often, indeed, two nuclei in a single cell." In addition the fibrous tissue beneath the epithelium is more vascular, and is infiltrated to a varying degree by leucocytes. When we reflect that the tongue, of all organs, has least opportunity to repair its injuries by rest, it is easy to understand why cancerous changes so readily attack its old, constantly irritated lesions. A curious point with regard to the enlarged glands is, that even after reaching a point where they ulcerate, suppurate, and continue to discharge for some time, they may yet, in rare instances, heal and shrink, although never entirely subsiding. Unoperated cases usually die within eighteen months after the first appearance of the disease either as a primary tumor or a carcinomatous degeneration of a chronic sore. Dissemination is a rare event.

From this and other facts, Mr. Butlin considers, and we agree with him unreservedly, "that carcinoma of the tongue is essentially a *local disease*, certainly not limited to that part in which it takes its origin, but yet surely to that part and the immediately adjacent parts, and to the neighboring lymphatic glands." To only one of the diagnostic points have we space to advert, viz., to the examination of *scrapings* of suspected carcinomatous ulcers, not, of course, of non-ulcerated growths. Mr. Butlin maintains that among non-important structures, "holding the most prominent place, both in numbers and importance, are many epithelial scales, no longer normal, but differing widely from the normal epithelium of the tongue and adjacent parts in almost all respects. The cells vary greatly in size and shape." . . . "There may be two or three, or more, nuclei, and the nuclei, whether they be one or many, are much larger than those of the normal epithelium of the tongue." . . . "Mother cells are often present, and not uncommonly the cell-nests, which are so characteristic of squamous-celled carcinoma." The author does not advocate the use of the microscope to the exclusion of a careful examination of the general features of the disease, nor insist that it is infallible, but merely that it is a valuable aid which he and his colleagues have found decisive in certain doubtful cases. He maintains that, in the microscopic examinations of scrapings of "more than one hundred tongues, healthy and diseased in various ways, but not carcinomatous," he "never once saw anything which resembled a cell-nest." If confirmed, this is a most valuable observation. Does complete recovery ever follow operation, especially early operation? Mr. Butlin answers yes, and approximately estimates the recoveries amount to 10 per cent. It must not be forgotten, however, that the operation itself is not devoid of danger, a mortality of more than 8 per cent. resulting from it.

The question of treatment is rightly divided into the treatment of the so-called "pre-cancerous" stage of various tongue affections, and the therapeutics of the fully developed disease. For the former, the avoidance of stimulating and irritating foods and drinks, with the use of either the mildest astringents, or the radical removal of the trouble by knife or cautery is advised. It is impossible to do anything like full justice to the long and interesting chapters on the various operations and after-treatment, yet we cannot forbear dwelling for a short time on certain points which seem especially important. Mr. Christopher Heath's method of controlling the hemorrhage from a stump, by the pressure of one or more fingers passed behind the base of the tongue in the pharynx and pressing it forwards, is eulogized and declared perfectly efficient. In the treatment of congenital warty growths, it must not be forgotten that they may be derived from altered nævi, and may, therefore, be very vascular. The removal of large warty growths is best effected by resorting to the use of the galvano-caustic loop, although the knife or scissors may be used if the mouth be gagged and efficient control of the tongue be obtained by ligatures passed through its tip.

In tongue operations it is recommended to tie the patient's hands securely by a bandage drawn beneath the body, while the lower part of the thighs are to be in like manner secured beneath the operating table. By this means the mouth, etc., can readily be cleared of blood by twisting the patient's body over, while loss of control is avoided. "Too many, rather than too few, precautions should be taken in any operation upon the tongue." Morrant Baker's, Whitehead's, and Bryant's methods of removing the tongue are described and advocated as the best. If the floor of the mouth be much diseased, particularly if there is the least suspicion that the glands are affected, Kocher's operation, providing as it does for free drainage and thorough antiseptic treatment, had better be resorted to. Of course a separate incision may be made to remove the enlarged glands, and an intra-buccal operation be done upon the tongue. Although hemorrhage, *per se*, is rarely a cause of death, yet a small loss of blood may prove to be a serious matter, as part is apt to pass down into the trachea and bronchi, there to decompose, causing affection of the lungs and septic poisoning. To these latter causes—the former being the more important—are due most of the deaths after removal of the tongue. The symptoms of septic pneumonia may occur within forty-eight hours, or not until later, but usually within the week. The mouth is horribly fetid and cannot be kept sweet, which doubtless has much, if not all, to do with the lethal result.

Careful study has of late years developed the important fact that most, if not all, of the causes of death after excision of the tongue are preventable. Although Kocher is the only surgeon thus far who has strictly carried out the Listerian method, Listerian principles as to dressings have proved eminently successful, as in Billroth's late use of iodoform gauze, wherewith the mouth is carefully packed. Kocher saved 13 out of 14 cases operated on, while Billroth's last 17 patients all recovered. As a proof of the good effected by iodoform, Woelfler and Paneth found that they could readily excite in animals a septic pneumonia similar to that in man by injecting certain decomposing fluids into the trachea, while the same fluids when injected *mixed* with iodoform proved innocuous.

Mr. Butlin remarks as to the choice of operations, "that the method of operating exercises infinitely less influence on the result than the after-treatment of the case." In uncomplicated cases first Baker's, second Whitehead's method seems preferable, with splitting of the cheek if the disease is not limited to the tongue. He is decidedly opposed to the galvano-cautery for removal of the tongue, but thinks highly of the cord écraseur. When the glands are involved, Kocher's method or a separate incision for the glands is recommended, through which the lingual artery may also be ligated if necessary. With the means now at our disposal for the control of hemorrhage, the author thinks that tracheotomy can hardly ever be necessary. Unless the disease has not recurred in the mouth, the glands are freely movable, and the health good, secondary lymphatic enlargements—due doubtless to glands overlooked at the primary operation—should not be meddled with. When the carcinoma recurs within the mouth, and the general health is not much impaired, provided the disease is fairly within reach, a second attempt at its removal is justifiable; but partial removals of the disease should never be attempted. As palliatives of the pain the thorough application of the actual cautery to the surface of the ulcer, and the division and possibly re-division after reunion of the lingual nerve are advised. Iodoform with morphia, and also salicylic acid are recommended to relieve fetor and pain.

The chapters on "Parasitic Affections of the Tongue" and "Fur" contain accounts of a rare case each of dracunculus and trichina spiralis. Mr. Butlin insists that his investigations prove that "fur" both in health and disease "is essentially a growth of fungus, chiefly of micrococcus and bacillus subtilis." Of the grounds for this belief we cannot say much. Nervous affections, including "spasm," "articulatory cramp," "involuntary protrusion of the tongue," "glossoplegia," and neuralgia, are thoroughly considered in a special chapter. It is pointed out that the treatment of the latter always extends over a long time, and that when any operation is demanded, stretching of the nerve is probably preferable to its section or exsection. We say "probably," since nerve-stretching has only been tried in one case, so far, and time enough has not elapsed to prove its value even in this case.

We have now concluded our very imperfect notice of this valuable book. While we have not criticized it adversely to any extent, it must not be imagined that we unreservedly approve of it. Thus, we think that it might in many places have been condensed with advantage; that more repetition has been indulged in than was necessary; and that some few things have been omitted which might better have been discussed. In addition, the author indulges in certain inelegancies of style, such as "squirting" morphia into the tongue, which no author ought to permit himself to use.

On the other hand it is a work of sterling merit, unexceptionally illustrated, and a valuable addition to our surgical literature which no active practitioner should be without. C. B. N.

ART. XXI.—*A Guide to the Diseases of Children.* By JAMES FREDERICK GOODHART, M.D., F.R.C.P., Assistant Physician to Guy's Hospital, and Lecturer on Pathology in its Medical School, etc. Revised and Edited by LOUIS STARR, M.D., Clinical Professor of Diseases of Children in the Hospital of the University of Pennsylvania. With Formulæ. 12mo. pp. 738. Philadelphia: P. Blakiston, Son & Co., 1885.

THE book which heads this notice was written, as we learn from the preface, to meet the expressed want of many medical students for a manual upon diseases of children. It is very questionable whether such a want was felt by American students with so many excellent and recent text-books before them, but, be this as it may, we are not disposed to find fault with the author for adding another good book to the already long list in this department of medicine. Dr. Goodhart evidently intended that this manual should occupy a position between the too brief handbook on the one hand and the exhaustive treatise on the other, and this fact should be constantly kept in mind in our examination of the book.

The author has avoided the not uncommon error of writing a book on general medicine, and labelling it "Diseases of Children," but has steadily "kept in view the diseases which seemed to be incidental to childhood, or such points in disease as appear to be so peculiar to, or pronounced in, children as to justify insistence upon them." It is pre-eminently a book written out of the author's personal experience. But few references are made to current pediatrical literature. In reading this manual one is impressed with the fact that it is not a mere compilation, but the studied utterances of a man who has enjoyed exceptional opportunities for observing the diseases of early life, is a shrewd clinician, and possesses the ability to state the results of his observations in clear, concise, and pleasant language.

The American editor has performed his delicate task in an unexceptionable manner. His additions are made with discrimination, not too extended or numerous, and, in some instances, add very largely to the value and completeness of the text. The convenience of the American reader has been consulted by rendering the expressions of the British Pharmacopœia, which are naturally used in the text, into those of the United States Pharmacopœia.

The introductory chapter briefly treats of those details which are so essential to the formation of a correct diagnosis for forecasting the issues of the case and for treatment. The necessity of methodical observation, the import of the various alterations in cry, expression, shape of head, and so forth, the best method of examining the several regions of the body, are clearly set forth, and the chapter closes with some general considerations upon the therapeutics of early life.

The "diet of children in health" next engages attention. We cannot now recall a better discussion of this important subject than is found here, though it could perhaps be extended to advantage. It would be well were its teachings thoroughly mastered by every mother as well as physician. However, it seems to us that the author is far too partial to the use of commercial baby foods. The occasions when it is necessary to resort to them are rare, in our experience at least, and it would be better were they totally banished from the infant's dietary. Full directions for the preparation of peptonized milk are given in the appendix, but less attention is bestowed upon its use in health and disease than its merits demand. How faithfully the following words reflect the experience of all who have much to do with the management of infantile diseases!

> "Mothers and nurses will say a child cannot take this and that, because they have administered the thing improperly. But if the medical man insists on a return to such diet under strictly detailed conditions—nay, sometimes it may be necessary to make it one's business to see a child at its meals, and what it is eating—no difficulty whatever will be experienced in its digestion."

Under the head of "Diet Diseases," atrophy, flatulence, colic, constipation, diarrhœa, vomiting, indigestion, and stomatitis are considered; rickets and certain affections of the skin, which would properly come under this heading, are reserved for future discussion.

In speaking of wasting from insufficient food a timely warning is uttered against overlooking organic diseases of the lungs and pleura, which, in feeble, ill-nourished infants, often creep on insidiously, and of which wasting may be the only marked sign.

We turn with considerable interest to Chapter IV. on Diarrhœa to see what new light is thrown upon the management of the common and fatal summer epidemics. In our humble judgment no one can read this chapter without a feeling of dissatisfaction: it is too brief to do justice to the important subject of which it treats, and is certainly not written with that clearness and force which characterize other portions of the work. The editor, however, evidently aware of the imperfection of the text, has interpolated about nine pages of matter, giving a fair *résumé* of existing knowledge upon entero-colitis and cholera infantum.

In the treatment of intussusception opium and warm fomentations over the abdomen are first recommended. If the symptoms are not speedily relieved, efforts at reduction should be made under chloroform, by manipulation, by inflation, and by the injection of large quantities of tepid water. The latter is the most efficient, though not wholly free from danger. The ordinary enema apparatus is, however, usually inefficient, and it is recommended that the rectal tube be connected with an improvised water-cistern placed high above the bed by which more equable and forcible pressure is obtained. The common fountain syringe fully meets all of the indications.

Laparotomy has been successful in only a few cases, and is only advised after a thorough trial of all other measures. The author strongly insists upon the importance of protecting the surface of the child from cold during the operation, a precaution often ignored by surgeons in this day of sprays and antiseptic precautions.

We would call especial attention to the discussion of the eruptive fevers. The chapters on measles and scarlatina will richly repay careful reading. Under the head of "Dropsy without Albuminuria," the author relates two interesting cases which came under his observation, and speaks of this condition as a not uncommon sequel of scarlatina. It may, however, be said that the connection of one of the cases with scarlatina is not proven. Several authorities are quoted, but no explanation of the etiology of these cases is attempted further than to remark that "it seems not unlikely from this and other cases that the dropsy is related to suppression of the urine." The editor, apparently somewhat skeptical, states, in commenting upon these cases, that he has never met with this condition, and very properly insists that the absence of casts should be proved by careful microscopic examination before declaring a dropsy following scarlatina to be independent of renal disease. He relates two cases in support of his proposition which are certainly not analogous to those reported in the text, and therefore not pertinent to the discussion. The rarity of these cases will perhaps justify us in briefly referring to one which occurred in our practice a few years ago. (See *Clinic*, June, 1874.)

A seven year old lad passed through a well-marked attack of scarlatina and was dismissed convalescent. On the seventeenth day his face and ankles were slightly œdematous. He vomited frequently during the night, and the next morning I found him feverish, his eyelids completely closed, face enormously puffed, and with an effusion into the chest and abdomen. He had passed no urine for at least eighteen hours, and careful percussion showed that the bladder was empty. A careful chemical examination of a small specimen of urine obtained soon after did not reveal a trace of albumen, and the microscope proved the absence of blood-corpuscles and casts. Other specimens were subsequently examined with the same result. He made a rapid recovery.

The chapter on Diphtheria is deserving of more than passing notice, partly on account of its intrinsic excellence and partly because some of the views enunciated are not in accord with those generally held by the profession. For many years we have believed that diphtheria is less contagious than is usually taught, yet we are hardly prepared to indorse the closing paragraph of the following quotation: "It is communicated by one patient to others by means of inoculation from a materies derived from the diseased parts, and thus doctors and nurses are chief sufferers; an imperfectly disinfected tracheotomy tube may impart it, and a healthy child put into a bed or a particular corner of a room recently occupied by a diphtheritic child may thus 'catch' the disease, but it is not communicated to other children or patients in a building, or carried about in clothing like measles or scarlatina." The editor enters a mild protest by stating, in a foot-note, that many authorities hold that diphtheria is contagious in the ordinary sense of the term. In view of the facts before us it is manifestly unwise to preach a doctrine which may be taken as an excuse for neglecting any precaution to prevent the spread of diphtheria.

Dr. Goodhart seriously questions the propriety of classifying diphtheria among the specific fevers:—

> "Diphtheria is a contagious blood disorder—some would say a specific blood disorder—meaning thereby a disease due to some definite and constant germ, but I avoid the term specific, because there are peculiarities about the disease which must to some extent raise a doubt whether it may not result from varied causes."

The author is a believer in the non-identity of membranous croup and laryngeal diphtheria, but states that the distinction must rest on clinical and not on histological grounds:—

> "My own opinion is that there are grounds sufficient for a belief in the existence of a non-diphtheritic membranous laryngitis, but, inasmuch as it is admittedly impossible to distinguish readily and certainly in doubtful cases between the two, and the question of contagion is involved in the decision, it is best to consider all cases as diphtheritic, and to take precautionary measures in accordance with that assumption."

The author is strongly committed to the doctrine that diphtheria is primarily a local disease, and consequently pins his faith to local measures in its treatment:—

> "For treatment, then, first and foremost, I place local applications, undeterred by the fact that they have often proved ineffectual. And of local measures, I prefer the application of antiseptics rather than escharotics. They must be repeated as often as membrane begins to form on the surface. . . . The plan that seems to me best to adopt is to detach and remove any membrane that can be reached, and then to apply the local application. . . . It is advisable to apply our local applications as gently as possible. But the little bleeding that ensues upon detaching a thick flake of perhaps fetid membrane can surely be of but little importance, and supposing that the membrane forms again, things are not worse than they were before.
>
> "I prefer a saturated solution of borax with soda, or boracic acid in glycerine, the solution being made by the aid of a water-bath, or a solution of permanganate of potassium, twenty grains to the ounce, or a ten-grain to the ounce solution of quinine, made by the aid of hydrochloric acid in equal parts of glycerine and water."

He prefers the camel's-hair brush to the atomizer for making these applications. We are greatly surprised to find no reference by either author or editor to the use of mercury in the treatment. The bichloride has been largely used of late years, especially in the laryngeal form of the disease, and the reports are certainly such as to entitle it to a place among the recognized remedies. When men of large experience, like Dr. Jacobi and others, state that more patients have recovered under treatment by the bichloride than from any other medication which they had previously employed, its omission from the list of remedies seems hardly pardonable.

Dr. Goodhart states, as the result of his observations in hospital practice, that a majority of the cases of diphtheria which prove fatal do so from laryngitis and extension of inflammation down the trachea. The author holds positive opinions in regard to tracheotomy. He considers the operation, both in its primary and remote effects, as a most serious one, and strongly condemns early operations. "The operation of opening the windpipe should be deferred to the latest possible limit." "It is, in fact, my belief that the broncho-pneumonia, the purulent bronchitis, the excessive tracheitis, so often seen in fatal cases of diphtheria, are chargeable quite as much to the operation as to the original disease." The only ground upon which he would justify an early tracheotomy is that it admits of the more thorough application of local remedies to the larynx, a position in which he will find few followers among modern clinicians.

> "When tracheotomy has been determined upon, the principle upon which success depends is to tamper with the tracheal mucous membrane as little as possible. To put a tube into the trachea and to leave it there, save for changing it occasionally, is but to exchange the risk of choking for the more deadly one of diffuse and ulcerative tracheitis. No doubt a certain sense of security is felt by the surgeon when a tube is safely in the throat, but it is dearly purchased for him by his patient, and the largest percentage of successes will certainly be procured by dispensing with the tube as much as possible."

Dr. Goodhart considers the time-honored division of pneumonia into lobar or fibrinous and lobular or catarrhal as misleading when applied to the pneumonias of early life.

The line of differentiation between the two forms of disease is less sharply drawn than by any author with whom we are familiar.

He admits that a pneumonia which has all of the clinical features of the croupous pneumonia of adult life is not uncommon in childhood, but states that even in these cases the lesion found after death is more often catarrhal than fibrinous.

> "Nor is the difficulty lessened by appealing to the facts of morbid anatomy; for acute pneumonia, be it clinically lobar or lobular, seems to me to present such appearances in every case as make any distinction between the two forms, save one of degree, a very difficult matter. I am not familiar with the red and gray hepatization which are described as occurring in childhood as in adults, when the disease is of the fibrinous form."

The chapter on Pleurisy contains a very excellent *résumé* of present knowledge on this important disease. The author places much reliance upon a puffy appearance of the face, such as we meet with in acute Bright's disease, as indicating the presence of large effusions in the chest. Attention is directed to the altered resonance over the apex of the affected side as indicating the presence of fluid at the base of the chest. Whenever a high-pitched tympanitic note replaces the normal resonance of the apex, suspicion of a pleuritic effusion should be at once awakened; and it should require stronger evidence than usual to convince us that there is really disease of the apex in the presence of any dulness at the base. Dr. Goodhart discredits the doctrine that a serous effusion is the origin of most of the empyemas, and considers the cases exceptional in which a serous is transformed into a purulent effusion.

He is not an advocate for paracentesis merely because of the presence of fluid, but would only operate in those cases in which the effusion takes place rapidly, is in great excess, and attended with displacement of the heart, fever, pallor, and puffiness of the face. When assured of the presence of pus in the pleural cavity, he favors its removal by a free incision, combined with free drainage, by means of as large an India-rubber tube as can be introduced. He reports twenty-six cases treated consecutively in this way with only one death, and that case was complicated with suppurative pericarditis and peritonitis. His experience has been exceptionally pleasant. Washing out the pleural cavity, even when the discharge is offensive, is considered of doubtful utility, and not without risk to life. The drainage-tube is to be dispensed with as soon as possible. "Inefficient drainage is no doubt the cause of many a bad result, but it is equally true that many a case becomes intractable from the too prolonged use of drainage-tubes."

As to the value of the excision of one or more ribs, recommended so highly by many authorities, he says :—

> "Applied to the majority of cases, the practice is unnecessary, and therefore bad. The treatment of empyema by incision, as I have just said, is as successful as it can reasonably be expected to be, if the cases are taken in good time; and in cases which have been long overlooked, or which have been long discharging, whatever we may do is, in the majority of instances, unavailing. The large aperture that is made by the removal of the rib quickly closes up, and we are no better off than before."

One hundred and twenty-two pages are devoted to the consideration of the diseases of the nervous system. The chapters on Meningitis and Chorea are deserving of special study. Simple meningitis is stated to be more common than is usually taught, and the too great tendency "to sweep all forms of meningitis of childhood into the net of tubercle" is deprecated. The diagnosis of meningitis is proverbially difficult. "There is no symptom which is infallible; there are no two or three which will not some time play us false; but the most reliable are retracted head, fever, causeless vomiting, irregularity of the pulse, and muscular rigidity or weakness." In the article on Infantile Convulsions, the use of chloroform or nitrite of amyl is not mentioned, assuredly our most trustworthy remedies for arresting the convulsive seizure. Dr. Goodhart does not believe in the common tradition "that chorea is likely to be set up in healthy children when they are associated with the choreic." He places rest in bed above all else in the successful management of these cases. "As regards drugs, if the case is in any way acute or violent, I order nothing, but the child is regularly shampooed twice a day for a quarter of an hour. This generally procures sleep. . . . When the more violent movements are quieted, then is the time to commence with drugs." Sulphate of zinc and arsenic have given the best results in the author's hands.

But want of space compels us to pass over many topics which are well worthy of notice.

A short chapter on diseases of the skin, about as satisfactory as such chapters usually are, followed by an appendix of formulæ, different from those found in the body of the work, concludes this excellent hand-book.

We have no hesitancy in recommending Dr. Goodhart's manual as a safe and reliable guide, and in many respects admirably adapted to the wants of the student and practitioner. The faults of omission, largely due to the effort to keep the volume within the designed size, are far greater than the faults of commission. However, they are few who will not be amply repaid for a careful reading of every page. W. J. C.

ART. XXII.—*Harveian Lectures on the Mode of Death from Acute Intestinal Strangulation, and Chronic Intestinal Obstruction.* Delivered before the Harveian Society of London. By THOMAS BRYANT, F.R.C.S., Senior Surgeon to, and Lecturer on Surgery at, Guy's Hospital. (Reprinted by the author from the *British Medical Journal*, November 22, 1884.) Small 8vo., boards, pp. 52.

THIS valuable contribution is so admirably condensed, that it will be impossible to give any adequate idea of the work without extensive quotations. We shall therefore confine our remarks to some few of the more salient points, with the earnest recommendation to all of our readers in whose power it lies carefully to study the original.

The work is divided into three lectures, the first being on the "Mode of Death in Intestinal Strangulation and Intussusception, with Reference to their Treatment." "Hitherto it has been the custom to place cases of strangulation of the bowel amongst those of obstruction, indeed, to consider them as only one of its forms." The author regards this as a serious error, since, although in strangulation obstruction is present, it is only one of its symptoms, and "not the cause of danger or of death." On the other hand, in cases of intestinal obstruction, the obstruction is the prime symptom and danger.

Mr. Bryant throughout these lectures endeavors, and we think with a fair measure of success, to found his principles of treatment upon the information obtained *post mortem* of the pathological changes which tend to bring about the fatal issue. Such examination then reveals that death in "acute intestinal obstruction," which the author thinks should always be called "intestinal strangulation," is not from the arrest of the passage of feces, "but from changes in the bowel itself and the parts above." These changes are in brief those directly due to the interference with the return of the venous blood from the constricted portion of bowel; if this process be a slow one, inflammation may be a complication; if the interference with the return circulation be sudden, static gangrene results. In those cases where a sudden and complete arrest of the circulation takes place in the incarcerated portion of gut, hemorrhage into the bowel both above and below the point of obstruction not uncommonly occurs. This may be so considerable that both hæmatemesis and bloody stools may be noted, as in a specimen case reported by Mr. Bryant. Such a condition, although indicative of serious damage to the bowel, is not necessarily of fatal import, provided that other conditions are favorable.

As a proof that the mere obstruction to the passage of feces is of trivial import in intestinal *strangulation*, the author cites the well-known fact that all the symptoms of acute strangulation of the intestine rapidly disappear when a hernia is reduced by taxis or operation, yet in some such cases "no action of the bowels may be obtained for two to three weeks subsequently." In such instances the mere failure of the bowels to pass on and evacuate the feces produces no special symptoms. Ulceration, perhaps leading to perforation, and gangrene resulting in a general peritonitis, are the evils to be expected. This ulceration is caused in subacute cases by the pressure of feces upon the distended, and possibly inflamed, bowel above the point of obstruction.

How should these evils be combated? Assuredly, as Mr. Bryant ably contends, in an external hernia, none would think of giving drugs, regulated diet, etc., while leaving unaltered the mechanical conditions upon which all the symptoms depend. Were there any essential differences in the lethal pathological changes found after death from so-called internal and external strangulation there might be some hesitancy as to the proper treatment, but there are *none*. Whether the form of strangulation be a true "internal hernia, a volvulus or band, the mechanical condition called strangulation exists, and, unless this can be relieved, the end by death cannot be averted. To make a more special diagnosis as to the form of strangulation is not required; to wait for it, is often to wait for a *post-mortem* investigation." Mr. Bryant truly says that in a patient who has had an old hernia, and who presents the symptoms of strangulated bowel, the surgical rule is imperative, viz., explore the hernia, then the neck of the sac, and finally the abdominal cavity. In cases presenting similar symptoms, but without any external hernia, the author hopes that before long a similar procedure, viz., an exploratory laparotomy, will become the rule in surgery. In both cases, as he frankly admits, a failure will often follow the attempt, but where success ensues, it is a life saved which would otherwise have been inevitably lost.

The argument that exceptional cases do recover without operation is no more valid than a similar one against herniotomy. Numerous illustrative cases from the *post-mortem* records of Guy's are then detailed. The success following operations upon "displaced herniæ" is another argument in favor of Mr. Bryant's position.

The examination of the records of the autopsies of a number of cases of intussusception shows that "death usually occurred from either gangrene of the entering or returning layers, or perforation by ulceration of the receiving, or external gangrene of the intussuscepted portion." Suddenly formed, these cases present symptoms similar to those of any other acute strangulation. In the more chronic form "inflammatory changes will have much to do with the pathology of the affection." In all cases these changes take place in the "receiving layer."

Inflation, in three of the twenty cases which Mr. Bryant has selected for examination, produced *rupture* of the bowel below the intussusception, while in a fourth, the child died in collapse shortly after the inflation. Hear what Mr. Bryant says regarding this method of treatment :—

> "In acute cases it is hardly applicable," the condition then approaching very closely that of an acutely strangulated hernia, and requiring as active treatment. "In the more chronic cases, such as in severity seem to be parallel with cases of obstructed or incarcerated herniæ, running on to strangulation, inflation may be justifiable, and even successful ; but then it must be employed" . . . . "within the first three days ; later on, changes in the bowel are almost certain to have taken place, which would render the treatment by inflation or injection fruitless, and probably dangerous."

Mr. Bryant advocates early operation in the acute case, *i. e.*, as soon as the diagnosis is made, and "in the more chronic on the failure of inflation employed within the first three days." When from delay laparotomy seems unlikely to be successful, Nélaton's enterotomy is advised. The danger of the simple "opium treatment" is illustrated by a case. Speaking of the cases of rupture of the bowel by inflation Bryant says : "Might I ask could the operation of laparotomy have been more fatal in the cases than that of inflation proved? Might it not, with a great probability, if employed early, have been more successful?"

Summing up, the author lays down the following as rules of practice :—

> "1. Laparotomy should be undertaken as soon as the diagnosis of acute intestinal strangulation is made. There should be no delay allowed for the formation of a specific diagnosis of its cause. It should likewise be proposed in all cases of acute intussusception, and of chronic, which have failed within three, or at the most, four days, to be relieved by other treatment.
>
> "2. In all operations of laparotomy, it is to the cæcum that the surgeon should first advance, since it is from it that he will obtain his best guide. If this be distended, he will at once know that the cause of obstruction is below ; if it be found collapsed, or not tense, the obstruction must be above. Adhesions or bands are, moreover, more frequently near to, or associated with, the cæcum, than with any other part of the intestinal tract. It is also in the right iliac fossa

that the collapsed small intestine in cases of acute strangulation is usually to be found; and with this as a starting-point, the surgeon will have less difficulty in tracing up the intestine to the seat of strangulation than if he begins at a distended coil, when it will be a matter of chance whether he travels away from or towards the special object of his search—the seat of obstruction.

"3. In a laparotomy, when the strangulated coil of bowel is gangrenous, it should be brought out of the wound, and the gangrenous knuckle resected. The proximal and distal ends of the resected bowel should then be stitched to the edges of the wound, and an artificial anus established.

"4. Nélaton's operation of enterotomy should be undertaken in all cases of intestinal strangulation, when laparotomy is rejected or seems to be inapplicable, as well as in cases of intussusception in which the invaginated bowel cannot readily be released. It should be performed in the right groin, or rather, right iliac fossa.

"5. If laparotomy succeed, the cause which called for it is removed, and the normal action of the bowel is restored. If resorted to early and as a rule of practice. it is probable that it would be more successful than the treatment by opium, inflation, or purgatives, which has hitherto been in vogue."

The second lecture discusses the important questions: "How does obstruction of the intestines destroy life? What changes does it bring about in the bowels which tend towards death?" The answer to the first is, that the lethal issue may be due to exhaustion produced by the inability to take or retain food consequent upon vomiting; to the second, that from the back pressure upon the gut above the obstruction, peritonitis results, all the more certainly if ulceration, sloughing, or rupture of the colon occur from over-distension.

It will thus be seen that the main causes of death are the secondary changes which take place in the bowel above the seat of obstruction. In proof of this, the author relates the histories and *post-mortem* examinations of a number of cases of the most typical of all forms of pure obstruction, viz., those of congenital malformations of the rectum, where death invariably resulted from peritonitis due to changes in the bowel. While reviewing this book we ourselves have lost a patient from this complication upon whom we had performed a Littré operation or rather Huguier's modification, *i. e.*, the incision on the right instead of the left side. It should not be forgotten also that simple *fecal impaction* may prove fatal, thus emphasizing the importance of a digital examination of the rectum in all cases of obstruction of the bowels. Illustrative cases are cited. A number of *post-mortem* examinations are detailed to prove how, from obstruction due to any cause, either the cæcum or colon may slough, rupture, or ulcerate, "as a direct result of the pressure backwards."

From Mr. Bryant's investigations he comes to the conclusion "that one-third of the cases of stricture of the rectum or lower bowel are not cancerous," a most important practical point with regard to treatment; and he goes on to show by cases how the ulcerations heal after colotomy. Of course this fact is known to practical surgeons, but certainly seems to be overlooked by many practitioners. For the practical points which Mr. Bryant gives for the determination of cancerous and other forms of stricture of the bowel, we must refer our readers to the text.

Mr. Bryant, in a few paragraphs, succinctly explains how strictures are formed, and why and how colotomy proves curative in other than cancerous cases. Excellent advice is given as to the treatment of cases of incipient stricture, viz., regulated diet, rest in the horizontal posture, and laxatives, such as enemata of olive or castor-oil in the commencing stage of obstruction. Purgatives are unreservedly condemned as productive of forced peristalsis of the bowel above the stricture. Belladonna combined with opium is thought highly of. "The use of enemata administered through the long tube is dangerous; in some cases, they may give undoubted relief, but in others they cause rupture of the bowel or perforation, and, as a result, fecal extravasation and death." We shall quote the author's conclusions, premising that the results claimed are fully borne out by the tables of cases appended—eighty-two—all operated upon by Mr. Bryant himself, and that these do not adequately convey an idea of the benefits conferred on the patients by colotomy, unless the text be also read.

> "1. In all cases of cancerous stricture of the rectum or colon, including the annular, which are not amenable to lumbar colectomy or anal excision, right or left lumbar colotomy is strongly to be advocated, with the well-grounded hope of relieving suffering, retarding the progress of the disease, and prolonging life even for five or six years.
>
> "2. Lumbar colotomy is valuable as a curative operation in syphilitic and simple ulcerations of the bowel which resist other treatment, including cases of recto-vesical fistula; and it is remedial in examples of volvulus of the sigmoid flexure, as well as of obstructions caused by tumors.
>
> "3. To secure these advantages, it is necessary for the operation to be performed before the pernicious effects of obstruction occur."

Those who desire proof of the above propositions are referred to the text. One point we cannot forego mentioning, viz., that certain cases which before operation have been supposed to be undoubtedly cancerous, have entirely recovered, as far as the ulceration goes, after operation, as in one of Mr. Bryant's cases, who fourteen years later was in robust health.

The author calls attention to the best means of preventing the passage of the feces past the lumbar opening into the rectum. This is not sufficiently provided for in any of the ordinary operations, although practically such a result is attained in most cases. Mr. Bryant has recently in two cases operated in the following manner, which, he says, has proved "eminently satisfactory." The muscles were freely divided down to the lumbar fascia, which, after hemorrhage had been arrested, was divided, thus exposing the bowel, which was separated from its connective-tissue attachments, so as to project well from the wound. Sufficient traction was then made upon the pelvic end of the gut to enable the operator "to bring outside of the deep orifice of the wound a complete knuckle of intestine, with its outer surface on a level with the skin-wound." Lint spread with vaseline was applied next the wound, outside this iodoform gauze, and outside all a mass of Gamgee-tissue, secured in place by an abdominal bandage, the turns of which passed *above* and *below*, but not *over* the lumbar incision. No bowel-stitches were used. In one case on the fourth, in the other on the fifth day, the gut having become adherent to the skin-wound, a small incision was made into the bowel by means of a tenotome; all the feces continued to pass through the anal wound. Mr. Bryant points out that these two cases, though promising, are not conclusive proofs that the feces will always be diverted from the rectum, and says, moreover, that this plan cannot be carried out in all cases.

The concluding lecture is devoted to the "Differential Diagnosis of Acute Intestinal Strangulation and Typhlitis." Mr. Bryant regards sudden perforation of the intestine from ulceration, an acute attack of peritonitis following some cæcal or pericæcal trouble, or an acute attack of gall-stones as the only conditions liable to be confounded with acute strangulation.

We confess that there are other conditions which have puzzled us, but as we are not writing an essay, but noticing a book, we shall do no more than call attention to the fact that others, less experienced than Mr. Bryant, cannot make a diagnosis as readily as he professes to do.

In perforation of the bowel, *collapse*, like that of cholera, is the first symptom, while the collapse of strangulation is slower, both in its onset and progress, never reaching the same degree as that of perforation until death of both bowel and patient is at hand. Two cases of perforating ulcer of the duodenum illustrating these points are cited.

The histories of many instructive cases of perityphlitis, inflammation of the appendix, perforation of the cæcum, etc., are given quite fully, the main deduction drawn being that the only symptoms common to acute strangulation and perityphlitis are "sudden acute abdominal pain and vomiting; and that whereas in intestinal strangulation these symptoms come on usually in a patient who has been hitherto perfectly well, in cases of typhlitis, on the other hand, there will either be a history of local trouble or other symptoms to point to it." Of course the common diagnostic points usually found are adverted to.

> "In the subacute cases, suppuration may burrow backwards towards the right loin, upwards towards the liver and diaphragm, or downwards towards the pelvis or thigh, or inwards towards the umbilicus. In some cases it will burst into the bowel. In every case, if left alone, acute peritonitis, grafted upon chronic, will bring about death." "Taking as our guide the causes of death, I am disposed to think the indications are tolerably clear;" . . . "they all point to an early incision made in the neighborhood of the cæcum for the evacuation of early inflammatory products in acute cases and of pus in chronic."

In all cases not yielding rapidly to medical treatment, Mr. Bryant advises cautious incision somewhat after the manner of tying the external iliac artery, and the evacuation by dissecting with the finger of any inflammatory products which may be found. When the cæcal appendix is involved resulting in localized peritonitis, Mr. Bryant says, with reference to opening the peritoneal cavity:—

> "For my own part, I can see no practical objection to the procedure; since, if the case be left alone, a diffused peritonitis is sure to follow the local one, and, as a result, death."

Among the fatal cases of cæcitis is one where death resulted from hemorrhage due to ulceration of the deep circumflex iliac artery. This is a very rare complication, and we should here like to put a somewhat similar one upon record which we saw in consultation the day before commencing this review. Two hemorrhages—the first quite a severe one—coming from what vessel it was impossible to ascertain, took place in the case of a patient in whom a spontaneous opening of the abscess had taken place to the outer side of the femoral vessels, an inch below Poupart's ligament. Pressure and styptics—chiefly the latter—had arrested the hemorrhage before we were called in, and the arrest has proved a permanent one.

In concluding our remarks, we cannot but express our envy at the almost unexampled experience which has fallen to the lot of Mr. Bryant, and our conviction that he has made the best of his opportunities. If we might venture a criticism, it is, that active surgical interference seems to be urged to its extreme limit. Perhaps, when advocating an advance, an extreme position must be assumed in order, figuratively speaking, to drag the mass of the profession—who are reluctant and timid—even a few steps forwards. But we cannot overlook the fact that that which is safe and proper advice to give to the experienced and wary, is the very reverse for those who lack these safeguards, for we have seen already too much of this rash and reckless cutting into cavities which we think ought to be still held in some respect, even if not worthy of the dread veneration with which we formerly regarded them. C. B. N.

ART. XXIII.—*Bacteriology.*

Researches upon the Common Bacilli of Cholera Asiatica and of Cholera Nostras. By FINKLER and PRIOR.

Ergänzungshefte zum Centralblatt für allgemeine gesundheitspflege. Bd. I., Heft 5 and 6. Bonn, 1885.

The Technology of Bacteria Investigation. Explicit Directions for the Study of Bacteria; Their Culture, Staining, Mounting, etc., according to the Methods employed by the most eminent Investigators. By CHARLES S. DOLLEY, M.D. 12mo., pp. xii., 263. Boston: S. E. Cassino & Co., 1885.

Pathological Mycology. An Inquiry into the Etiology of Infective Diseases. By G. SIMS WOODHEAD, M.D., F.R.C.P. Ed., and ARTHUR W. HARE, M.B.C.M. *Section I., Methods.* With sixty illustrations. 8vo., pp. x., 174. Edinburgh: Young J. Pentland, 1885.

FINKLER and Prior have recently published the results of their last work upon the comma bacilli of cholera Asiatica and of cholera nostras. These observers will be remembered as having discovered a curved bacillus in the dejecta of persons ill with cholera nostras in an epidemic of that disease in Bonn last fall. The microscopic appearances of this organism were so similar to those of Koch's bacillus of cholera Asiatica that it was at first considered to be identical with the latter. Certain differences in its behavior under cultivation, however, seemed to point to the existence of a specific difference between the two, and the work before us is the result of an attempt to prove exactly what these differences are. An exhaustive account of the discovery and morphological properties of the two organisms is given; and a full description and tabular statement of all the inoculation experiments performed form a large part of the work. As a summary they give the following conclusions:—

I. They confirmed the occurrence of Koch's comma bacillus in the intestinal contents and in the dejecta of cases of cholera Asiatica in the epidemic in Genoa in 1884.

II. They also found comma bacilli in the dejecta of patients ill with cholera nostras. This they did by direct microscopic observation, and they also obtained them in pure cultures, and observed their peculiarities.

III. The two comma bacilli are vibrios which form genuine *spirilla.* The two vibrios are similar as well in this stage as in the variations from this form which they pass through.

IV. Their behavior under cultivation in most culture-media is the same. A very slight difference appears under varying culture-media and temperature, and this difference is a *relative* and not an absolute one—

being a greater energy of growth and vitality in the vibrio of cholera nostras.

V. They determined very carefully the *marked resistance* of the two vibrios to drying, varying temperature, and "Fäulniss."

VI. They admit the possibility of a "resting-stage," and think it probable that this resting-stage is similar to the spore-formation of other micro-organisms.

VII. *Both vibrios are pathogenic.*

VIII. The pathogenic power of Koch's vibrio is greater than that of Finkler and Prior's; here also the difference is only relative.

IX. The specific power is not active against all species of animals, a large number of which possess an immunity against both vibrios. When it is active it is only under certain conditions. The susceptible animals and the conditions under which its activity is best seen are the same for both vibrios.

X. The symptoms produced by the vibrios in the bodies of animals are very similar to those of cholera in man; they are not however specific, since they can be produced in guinea-pigs by other infectious materials and chemical substances.

XI. The specific relationship between the comma bacillus and cholera Asiatica is rendered probable by its constant presence, but it has not been rendered certain by the experiments upon animals.

The specific relationship between the comma bacillus of Finkler and Prior and cholera nostras is rendered probable by the observation of the micro-organism and also by the slight differences between the two diseases, as well as the biological and pathological similarity of the two comma bacilli.

XII. The two vibrios can pass into the blood after injection into the intestine, and be excreted in the urine. The situation of Koch's vibrio in the body of an animal increases its rapidity of growth, so that a new similarity under cultivation is established between the two vibrios.

As this is the most complete work upon the subject of the relationship between these two organisms yet published, or likely to be published, so does it furnish the best idea of the two that has yet been given. As will be seen, the authors abandon any claim of identity for their discovery with that of Koch. They merely show the very great similarity between the two bacteria, and by so doing offer the most complete justification for their first thought that the two comma bacilli were identical. Having done this much, they are certainly entitled to all the credit for the isolation and study of a new form of vibrio that would be given to any other workers in the same field. Their results are the results of patient research, and are the more creditable because reached under somewhat trying conditions. They publish a number of very beautiful plates of the microscopic appearances of the two organisms as observed under different conditions of cultivation, and of occurrence in the animal body.

They devote a small amount of space to Emmerich's bacterium, which they consider to be merely an accompaniment of the disease, and to have no specific influence upon it.

Their conclusions are different from those of Koch in some minor particulars, but on the whole support his assertions. The work is exceedingly creditable to the authors, and in refreshing contrast to some other productions upon the same or similar subjects.

The other two works whose titles are given above are the latest additions in English to the literature of bacteriology. Neither of them represents very much in the way of original work, but both are issued for the purpose of aiding such work.

Dr. Dolley's book is "presented with the hope that it will stimulate careful study of the schizomycetes by American investigators."

The subject is considered under three heads. 1. General directions. 2. Special methods for investigating pathogenic bacteria. 3. Formulary. Under the first head are given concise directions for the study of bacteria in general, and various ways in which they are collected or observed in air, water, earth, or animal tissues. The methods of preparing specimens for microscopic examination, section-cutting, and photographing are explained. Cultivation experiments in all their various forms are described, and this part is concluded by a short mention of the way in which inoculation experiments should be performed, and of biological analysis.

The various diseases which have been connected with bacteria are taken up in alphabetical order in the second part of the work, and pretty nearly every one who has had anything to say upon the subject is given a hearing.

The last division contains the formulæ of all of the staining fluids and culture-media in common use in investigations upon bacteria. In the composition of the gelatine culture-medium, however, we regret that the commonly accepted ten per cent. of gelatine is not accepted, for uniform results can be obtained only by the employment of identical methods by all observers.

The book is unpretentious, and of course will find its widest usefulness among students. Therefore the lack of discrimination between the value of various methods is open to severe criticism. The time has passed when no selection between good, bad, or indifferent should be made. As it is meant especially for an American public, it might have been well also to advise the beginner that it is not necessary to send abroad for the materials used in this kind of work, inasmuch as they can all be obtained in this country.

The form of the book is inconvenient for the laboratory, and its size and consequent cost are increased by the unreasonable amount of space devoted to the literature, the references being printed in the same type as the text, and occupying fully one-third of the entire volume.

Of Woodhead and Hare's work the first part only has yet reached us. It is to be divided into two volumes, the first devoted to "methods;" the classification and consideration of the properties of the pathogenic bacteria are to follow later.

The preface of the part before us states that one object of the work is "to show how extremely simple are most of the methods of research," and to "point out that artificial cultures are easily made." We understand that the book has not met with much favor on the Continent, and certainly such statements as these would make an unfavorable reception probable. We cannot record our objections to them too strongly, and we must confess our inability to believe that a prolonged practical acquaintance with the subject could lead to any such conclusion. Certainly this opinion might be supported from the text itself, for nowhere is there to be found evidence of original work upon the part of the authors.

The book contains a discussion of the position of bacteriology at the present time; a short explanation of the methods of examination, microscopic and otherwise; of the solid and liquid culture-media employed, amongst which are some which are practically obsolete; and of the methods of separating micro-organisms from the tissues. There are also two appendices, containing a short description of certain fungi commonly found in laboratories, and an extensive and somewhat inconveniently arranged literature of the subject. There are sixty illustrations, varying from good to very bad. The chromo-like pictures of potato cultures, pp. 60–61, are especially bad.

The demand for a good work upon this subject in English cannot be said to have been filled by either of the books under consideration. Taken together, however, and under critical advice, they will be of service to the student who has not a working knowledge of German and French.

H. C. E.

ART. XXIV.—*A Practical Treatise on Nasal Catarrh and Allied Diseases.* By BEVERLY ROBINSON, A.M., M.D. (Paris); Clinical Professor of Medicine at the Bellevue Hospital Medical College, New York; Physician to St. Luke's and Charity Hospitals, etc. etc. Second edition, revised and enlarged. With one hundred and fifty-two wood-engravings. 8vo. pp. xii., 276. New York: Wm. Wood & Co., 1885.

FIVE chapters have been added to this excellent work, and the text of the first edition has been subjected to revision and amendment, with the introduction of new material where the advance of knowledge has rendered such additions necessary. The new chapters are devoted to the study of 1. Aural Complications of Catarrhal Inflammation of the Nose; 2. Deflections of the Nasal Septum and Bony Obstructions of the Nasal Passages; 3. Ulcerous Coryza; 4. Adenoid Vegetations at the Vault of the Pharynx; 5. Mucous Nasal Polypi.

Dr. Robinson's style of writing is diffuse, and his treatise would have gained more from judicious erasure than it has from some of the material added. In many places, too, the additions are too obtrusively interjected, as if time had been lacking to fit and adjust them properly. While these faults detract from the pleasure with which the book is read, they are, after all, insignificant in comparison with the many positive merits of the treatise. Dr. Robinson is a careful student and a conscientious teacher. Avoiding extravagant and indiscriminate laudation of his plans of practice, he nevertheless expresses clearly and decisively his appreciation of the value of agents and methods which experience has commended to him; and with equal frankness sets forth his disapproval of procedures which have failed in his hands to produce the results claimed by their advocates. Everything new receives his consideration, whether or not it meets his approval. Indeed he has in many instances shown a leniency to ill-judged and often dangerous practices recommended by recent writers—recommendations in marked contrast with his own conservative teachings—that a personal familiarity with the results of the treatment would not have permitted.

The anatomy, physiology, and pathology of the nose are well studied, and the hygienic directions under the head of "prophylaxis and treatment of coryza" form one of the most valuable portions of the book. In the treatment of acute coryza, the author is apparently not aware of the abortive value of atropine in small doses, frequently repeated. Acute coryza is regarded as contagious, even when not part of an epidemic of influenza, measles, etc. We doubt the general acceptance of this view by the profession.

Chronic coryza is divided into two forms, humid and dry. Dr. Robinson does not indorse the pathological views which regard hypertrophy of the turbinated bodies as a normal sequel of simple chronic rhinitis—or, as he prefers to call it, chronic coryza. In many instances he attributes this condition, at least "in part, to a mischievous therapeutic method previously adopted . . . . the repeated applications of douches, injections, or sprays to the Schneiderian membranes."

However true it may be that in Dr. Robinson's experience patients suffering with chronic turgescence or actual thickening of the mucous membrane of the turbinated bodies have previously been treated either by themselves, or by their medical advisers, according to some one of the plans disapproved by him, it is equally true that in the experience of others many such patients have previously received no treatment whatever. Nor can we agree with his sweeping condemnation of "douches, injections, and sprays," all of which methods of treatment are useful within proper limits, and often in our experience indispensable.

In the local treatment of chronic coryza, the author recommends the insufflation of powders, occasionally resorting to a detergent or disinfectant spray for cleansing purposes, but especially avoiding the routine use of the latter as urged by many eminent authorities. In addition to local medication by powders he addresses suitable remedies to the constitutional diathesis, when he finds syphilis, scrofula, or herpetism present. It is to be regretted that the name of a proprietary preparation mars the pages upon which he gives formulæ for some of the few sprays he considers admissible. As to the merits of the preparation in question, its therapeutic virtues are certainly no greater than those of carbolic acid, chlorinated soda solution, or a dozen other well-known legitimate agents; and as agreeable a perfume can be readily supplied by any skilful pharmacist.

The various operative procedures in vogue for the removal of obstructing tissues (so-called "anterior and posterior hypertrophies") from the nasal passages are fully described and illustrated. As to the sensations of the unfortunate individual depicted upon page 112, nothing is said, but one could wish, for his sake, that, if the desired result were possibly attainable with less instrumentation, the simpler method should be preferred. To those colleagues "who neither own an electric cautery nor are sufficiently expert to make the snare practically useful," Dr. Robinson does not hesitate to recommend evulsion of the redundant mucous membrane by means of suitable forceps. Had the author persisted more faithfully in the use of laminaria tubes for the reduction of these obstructions by equable local compression, he would have found operative measures necessary even less frequently than he has indicated. But the secret of success in this plan is persistence.

The chapter on "Follicular Diseases of the Naso-pharyngeal Space" is thorough, and in the main judicious. The author properly regards the pathological condition which obtains in "post-nasal catarrh" as the same with that occasioning "follicular pharyngitis," differing only in its localization. He believes in the existence of a "catarrhal diathesis," as the great predisposing cause, and looks upon "widely disseminated climacteric conditions" as the exciting cause in many instances. Treatment must be both local and systemic. The systemic remedies most useful are sulphur, cubeb, and ammoniac. The local treatment is conducted by means of sprays and powders. In some cases a brush must be used both to detach hardened mucus and to convey medication to the affected tissues. We cannot agree with the author in looking upon this disease as a cause of phthisis; nor does it appear to us to be at all contagious.

The aural complications of nasal disease are briefly and judiciously treated of. "Deflections of the Nasal Septum and Bony Obstructions of the Nose" forms the title of a carefully written chapter, which contains all that is to be said upon these subjects, with the exception of the ingenious "plan to cure crooked noses" devised by Dr. John B. Roberts, of Philadelphia. This chapter would be the better for a word of caution to indiscreet operators, that the latter end of their patients will, in many instances, be worse than the first. More than one nose has been crushed, and punched, and gouged, and drilled for deviation from a classical standard of formation that detracted from its beauty, but was hardly sufficient to warrant operative interference. A bony spur from the superior maxilla is so frequently encountered that we have almost ceased to look upon it as abnormal, and certainly should not deem it sufficient provocation for the use of saw, chisel, or dental engine. Implication that septal deflections and bony obstructions never necessitate operation is not intended, but simply an intimation that operations are sometimes performed unnecessarily. Dr. Robinson does not seem to appreciate the good results sometimes obtainable in cases of deflected septum, from simple pressure, by means of a soft, wooden plug, properly shaped to the parts.

"Ulcerous Coryza" is well studied, and the limitation of the term "ozæna" to the symptom "fetid breath" properly insisted upon, stress being laid upon the peculiarity of the odor of true ozæna as distinguished from the fetidness of the breath due to carious bone, etc. Dr. Robinson agrees with Fournie that "in the case of ozænic patients the glands of the pituitary secrete this special fetid odor," rejecting the theory of Krause which attributes the odor to an excessive formation of fatty detritus. The microbic theory is set aside because no special bacterium has been isolated, the author having apparently concluded his manuscript before Lœwenberg's researches had been published. While the disease may occur independently of syphilitic taint, syphilitic cases are altogether the most frequently met with. Potassium iodide alone, or the mixed treatment may be employed, according to indication. Rouge's operation is not approved by the author, but he prefers Goodwillie's method of extirpating carious or necrosed bone by the use of the dental engine with suitable burrs, if any operation at all be deemed advisable. In the treatment of adenoid vegetations, Meyer's operation and snaring with the cold wire, after the method of Bosworth, are preferred to the use of forceps. Here again the experience of many reliable observers is contrary to that of Dr. Robinson. The various methods for the removal of mucous polypi of the nose are considered and illustrated, evulsion with the cold wire snare being deemed the preferable procedure.

An appendix, which might have been omitted without great detriment to the value of the book, gives an abstract of peculiar views concerning deviated septum and nasal catarrh published after the body of the work was in type. Dr. Robinson does not comment upon these views, but we doubt their acceptance either by specialists or general practitioners. Summing up, we can safely commend the book as a thorough study and an impartial presentation of its themes, containing, upon the whole, judicious directions for the prevention, alleviation, and cure of the diseases of which it treats.

S. S. C.

ART. XXV.—1. *Some Common Injuries to Limbs, their Treatment and After-Treatment, including Bone-setting* (so-called). By EDWARD COTTERELL, M.R.C.S. (Eng.), L.R.C.P. (Lond.), Late House Surgeon University College Hospital; Atkinson Morley Surgical Scholar University College, London, etc. With Illustrations. Small 8vo., pp. 102. London: H. K. Lewis, 1885.

2. *Face and Foot Deformities.* By FREDERICK CHURCHILL, C.M., Surgeon to the Victoria Hospital for Children. With Illustrations of New Appliances for the Cure of Birth-mark, Club-foot, etc. 8vo., pp. 195. Philadelphia: P. Blakiston, Son & Co., 1885.

1. IT is a grave fault to add to the rapidly increasing mass of medical literature without due reason, so that we shall first quote from the author's preface to show the scope of the work, and then endeavor to show our readers how well the proposed plan has been carried out.

> "In presenting this small book to the profession, I am actuated by an earnest desire to draw more attention than is generally given to the after-treatment of injuries, and more especially to those injuries occurring in the extremities. The neglect of this after-treatment is the cause of bone-setters flourishing in our midst, and I have endeavored in the following pages to give a short account of some common injuries to limbs with the hope that a more extended knowledge of the after-treatment necessary in order to bring about a successful issue will help to eradicate the popular faith in the so-called bone-setting."

From the foregoing sentences it may be surmised that this book resembles Dr. Wharton Hood's, or the famous lecture of Sir James Paget on "Cases that bone-setters cure," and the supposition is a correct one. Much of what the author says is chiefly, if not entirely, applicable to England, since "bone-setters" are not common in this country. The author's views on so-called passive movements are correct. It is often provocative of trouble, since a stretched adhesion gives rise to inflammation when a torn one does not, but he errs nearly as much upon the other side, so that his teachings tend to mislead the inexperienced into believing that forcible manipulation of a joint is the only and the certain cure for a stiff or painful articulation. Now this is neither correct doctrine nor safe practice. We all must have seen cases where fatal damage has been done by such treatment, even in the hands of skillful surgeons; how much more likely is this to occur among the rank and file of the profession! The truth is that most cases of fracture or dislocation do well with what Mr. Cotterell would call the let-alone-treatment, while some require constant surgical care for a certain time, which care in a few cases demands forcible breaking up of adhesions. Even in some of those apparently fitted for such treatment fatal damage ensues. Our remarks are intended to apply only to traumatisms which have stiffened joints, and so also are the author's.

We think that the author's views as to dislocation of the long head of the biceps are erroneous.

"Lawn-tennis arm" and "Lawn-tennis elbow" are fully considered, and good suggestions made as to their treatment. We are sorry to see the common error of recommending a certain splint as *the* proper one to treat a certain fracture, as, for instance, Carr's for Colles's fracture. We think the principle of construction of this splint a good one, and frequently use it, but we personally *make* it for each case unless an old one seems to suit, and we consult the conformation of the sound radius in each instance. Provided the true nature of the injury be understood, and the displacement properly reduced, any splint, or no splint at all, will bring about a satisfactory result. We do not agree with the author that reduction must be effected by extension and flexion of the wrist; some cases may be thus replaced, many more not, but we have not space to enter into details, since the truth of our statements must be acknowledged even by those of little experience.

We had thought that the fashion of treating recent fractures of the thigh by plaster of Paris had gone so out of fashion by reason of certain manifest disadvantages that new and expensive apparatuses would hardly be invented, but evidently our author disagrees with us, since he pictures a most formidable affair, a modification of Sayre's tripod suspension apparatus.

"Lawn-tennis leg" is to be treated, first by elevation of the limb for about five minutes above the level of the head of the patient, who is of course recumbent; then adhesive strapping is to be firmly applied "from two inches above the ankle-joint to above the thickest part of the calf;" and finally the patient must be at once urged to walk about, the surgeon seeing that "he puts his heel well down upon the ground." We dissent totally from the correctness of the author's views as to the stiffness and consequent lameness after Pott's fracture, and we cannot pass by without rather severe comment the statement that it is not uncommon, when the foot is not kept at a right angle with the leg, to have "a subluxation of the foot backwards," which should be treated by division of the tendo Achillis.

To an American reader the statement that the plaster-of-Paris bandage is to be made by rubbing plaster into muslin bandages is misleading, since it is always prepared from cheese cloth, tarlatan, or some similarly open-meshed material. What the term "muslin bandage" may include in England we cannot say, but no fabric of that name here will hold enough plaster to make a useful dressing. The book closes with a remarkable cure (?) of a bad case of rheumatoid arthritis by forcible manipulation of the affected joints!

With every desire to do the author justice, and recognizing that most of what he says, although exceedingly "sketchy," is correct, we yet cannot acquit him of the charge of writing an unnecessary book, while Wharton Hood's treatise or Sir James Paget's lecture is so readily obtainable, not to mention most good text-books.

2. The author of *Face and Foot Deformities*, in his preface, declares that he has used the term deformity "in its broadly generic sense, as applicable to all surface lesions and symmetrical defects." We can bear testimony that he has not restricted himself in his choice of topics, as he treats of nearly every conceivable subject, from "black eye" to corns.

We somewhat question the propriety of considering arcus senilis and the facial distortion of hemiplegia to be "deformities" of the face, but then we have never before considered deformities in a "broadly generic sense."

Mr. Churchill understands a deformity to be "any recognized alteration in structure, whether temporary or permanent;" . . . "a deformity, in fact, is anything that is manifestly ugly or crooked." Truly a most catholic definition!

The author likewise asserts that he has confined himself to surface deformities, and again practically demonstrates how little meaning can be nowadays attached to any name by carefully describing and figuring a case of total excision of the os calcis, and discussing the advisability of removing the astragalus in unreduced luxations of that bone, amputation or excision for compound luxations of the ankle, etc. etc. Surely the deformities produced by such conditions may *appear* upon the surface, but cannot be called surface deformities.

The book is a small one, and has the text reduced by a considerable number of cuts, yet the author attempts to consider over one hundred and fifty different conditions! Reading this book is like studying a rather full table of contents for an encyclopædia. Not that the book is without good points. Far from it; but improper omissions have been mistaken by the author for terseness, so that the condensation has been carried to the point where perspicuity ceases.

To attempt a detailed review of such a work is impossible. The pathology is altogether new to us. Thus nævi are said to appear "when the ultimate radicles have become fused, so that there is a permanent collision of blood-currents, causing venous and vascular dilatation, distension, and sacculation, with hypertrophy of vessels in the surrounding connective tissue."

"Port wine stains" the author treats by punctiform cauterization through a perforated metallic plate by means of a finely pointed Paquelin cautery. The author thinks that in "warts" "the epithelial covering of the papillæ takes on excessive growth, resulting in hypertrophy and elongation of this group of papillæ." We were always under the impression that the epithelial cells certainly had nothing to do with the initiation of the process, and we still think so.

The following definition of erythema nodosum rather astonished us, viz., "brawny circumscribed patches of redness about the size of a florin surround a central vesicle or ulcer, having an irregular punched-out appearance." We certainly did not before know that any form of erythema was a vesicular or pustular disease! The description of facial erysipelas is almost equally incorrect. We think the author's advice to remove the fragments of a broken upper jaw bad, as only tending to increase deformity. In passing we would ask, If a comminuted fracture of the upper jaw is a surface deformity, what is a deep one? We are told to plug the nostrils in a fractured nose to arrest hemorrhage. This is almost never necessary.

The directions as to plastic surgery amount to little more than a catalogue of various deformities and the general advice to remedy them by a plastic operation, but how or when does not appear. As to the directions for operating upon a hare-lip we can only express the hope that the results attained by the author are better than the descriptions of the operations, in which, also, he differs on some radical points from most surgeons. The suggestion to attack nævoid growths in the substance of the lips from the buccal mucous membrane by some form of cautery, carefully avoiding the skin, is a good suggestion. We should like to know what the "roots of the disease" means when applied to nævi.

We learn for the first time that "coloboma may result from the imperfect closing of a wound in the upper lid." We have heard of a coloboma which is congenital, but never of an acquired one of the upper lid. We are likewise surprised at the alleged cause of conical cornea, which is certainly opposed to all authority.

Among the foot deformities is an account of an interesting case of complete separation of the tarsus from the metatarsus which was successfully treated by the plaster bandage. Some excellent advice is given concerning proper foot-wear, both for prophylaxis and cure of the acquired deformities of the feet. There is nothing new or demanding special comment in the author's account of club-foot, but in its treatment he claims that it is useless to attempt eversion of the foot in many cases of varus, when the tendo Achillis is contracted; he thinks this tendon should first be cut. In "what is called T. equino-varus, the tendo Achillis" . . . "is that which is most at fault" and must be divided. Mr. Churchill discards all apparatus, uses forcible manipulation, and puts up the foot in a rather ingenious but unnecessarily elaborate modification of the ordinary plaster bandage.

In conclusion we would say that we have pointed out the most serious of the sins of commission of the author, but we cannot conceive of any necessity for the publication of a book which, from the number of subjects treated of in such a small compass, can be little more than a catalogue of diseases. There is no doubt that the author has had a wide and varied experience at the Victoria Hospital for children, and it is a matter for regret that he did not expend his energies upon some half dozen of the one hundred and eighty odd topics of which he writes. Then we should probably have had some real addition to our surgical knowledge, while by the perusal of the present we can hardly be said to have been much instructed.

C. B. N.

ART. XXVI.—*Recent Treatises on Gout.*

1. *The Regimen to be Adopted in Cases of Gout.* By Dr. WILHELM EBSTEIN, Professor of Clinical Medicine in Göttingen. Translated by JOHN SCOTT, M.A., M.B., Honorary Physician Manchester Southern Hospital for Diseases of Women and Children. 8vo., pp. 68. London: J. & A. Churchill, 1885.
2. *Gout in its Clinical Aspects, an Outline of the Disease and its Treatment, for Practitioners.* By J. MORTIMER GRANVILLE, M.D., Member of the Royal College of Physicians in London, Mem. Corr. Étranger Société de Paris. 12mo., pp. 307. London: J. & A. Churchill, 1885.
3. *Gout and its Relations to Diseases of the Liver and Kidneys.* By ROBSON ROOSE, M.D., Fellow of the Royal College of Physicians in Edinburgh. 12mo., pp. 158. London: H. K. Lewis, 1885.

IT must be reluctantly admitted that we can claim little progress towards the ideally successful treatment of gout since the days of the renowned

Sydenham, who, as a result perhaps of being himself a martyr to the torture of this agonizing malady, devised remedial measures which still hold their place in the therapeutics of this disease. But venerable, aristocratic, and therefore conservative, as Podagra is usually deemed, its dignity has not exempted it from the general tendency of practical medicine at the present time towards *prevention*, as far preferable to, and frequently far more feasible than, *cure* of physical derangement, and a cursory examination of the volumes before us shows that in each the question of prophylaxis is considered with especial care. In fact, the work of Dr. Ebstein, the celebrated professor of clinical medicine in Göttingen, has been written almost exclusively from a prophylactic point of view, an aspect which certainly affords the best avenue for a triumphant attack upon this atrocious enemy of mankind.

Prof. Ebstein is a firm believer in the doctrine that effeminacy and luxury are powerful predisposing agents in the production of gout, and quotes Seneca to prove that the surprising increase of this disease in Rome, during the first century of the Christian era, was a consequence of increased luxury in living. The Roman philosopher adduced as sufficient proof of this, the frequent occurrence of gout in the female sex, remarking that " women, in fact, who in his time were not behind men in licentiousness of life, were attacked by gout themselves, whereas in the time of Hippocrates, when they lived a simple and modest life, they were spared its onsets." Our author also fully accepts the current opinions as regards the hereditary nature of gout, declaring that this is at least as important a factor in its production as excess in eating and drinking, combined with inactivity of life, for excesses we may avoid, but hereditary influences we cannot escape. In this respect he recommends close attention to the principle, so humorously inculcated by the adage, "we cannot be too particular in the choice of our ancestors."

Acknowledging that Garrod, in 1859, was the first to demonstrate conclusively that the *materia peccans* of gout is uric acid, Dr. Ebstein claims to have proved that this acid is a chemical poison, which can cause not merely inflammatory, but also necrotizing and necrotic processes in animal tissues; and by a further series of experiments in which the symptoms of gout were produced in birds by tying the ureters, and also destroying the renal epithelium by the hypodermatic injection of chromic acid salts, he has also shown, to his own satisfaction at least, that the gouty changes in the body are the necessary consequences of uric acid. Our author repudiates the theory of Dr. Garrod, which attributes the phenomena of gout to retention of uric acid as a result of renal disease, and contends that the gouty process, in by far the majority of cases, may be developed and continue for a long time without the parenchyma of the kidneys being materially injured, or in any way hindered in the exercise of its regular healthy functions. In regard to the localization of gouty inflammations, he asserts that everything which promotes the circulation of the fluids in the body hinders the development of gout, while everything that restrains, disturbs, retards, or arrests the circulation gives an impetus to the gouty process. In support of this important generalization, which is capable of so many practical applications, he mentions the interesting observation of Charcot, who records that, in making a post-mortem on the body of a woman forty years old who had suffered from hemiplegia, he found the majority of the joints on the paralyzed side of the body infiltrated with uric acid salts.

With these facts and principles as a basis, Dr. Ebstein urges that, in the effort to lay down rules for the mode of life most suitable to gouty patients, more attention should be paid to the gouty predisposition than is generally the case. That is to say, persons who suffer from gout should at an early period attend to the dietary and training of their children, and medical men can by intelligent prophylaxis be of much service in the instruction of people who are amenable to advice, for, without predisposition we may say, as a rule, there is no gout. Whether and how far, says our author, this power of hereditary transmission may be weakened, cannot be settled with absolute certainty, but, as Corradi in particular has tried to show from a series of cases, the study of the history of culture among nations leads us to the conclusion that through a series of generations long-continued moderation exercises a favorable influence on the frequency and course of gout in the later generations. "In this respect to coöperate in the weakening of gout is the task and duty of every gouty person and every one disposed to gout who have children."

In approaching the problem of regimen in gout, Dr. Ebstein maintains that, since we have to do, not with deficient elimination, but with increased production of uric acid in anomalous positions, particularly the muscles and medulla of bones, the first step is to seek methods of checking uric acid formation in general. Whilst admitting that the use of animal food increases the production of uric acid, our author asserts that the intestinal canal in gouty patients is very susceptible to functional disturbances, so that, if we select a purely vegetable diet, the actual quantity of nourishment thus taken will be so great as to overpower the efforts of the bowel to manage it. Hence, he advocates a mixed dietary, allowing, as directed by Cantani, flesh meat, soup, eggs, and fish, in moderate, and vegetables in greater quantity. But, although he accords with the Italian physician in reducing or prohibiting the carbo-hydrates in general, he makes an exception in regard to fats, provided they are of the best quality. Equally important with attention to the kind of food is limitation in regard to quantity. "The gouty individual stands in the first rank of those who must *eat merely to live.* If ever he has found any pleasure in *living to eat*, he must wean himself from it as soon as possible. Sweets apart, our gouty friend may be as ticklish (dainty?) as he likes, but he must never be a glutton. He must cease to eat as soon as the first feeling of satisfaction comes on, nor must he give way to the false appetite which develops after this, and which if gratified brings him to the *non-possumus* stage." As regards relishes, such as condiments in general, vinegar and so forth, only that quantity should be taken which is absolutely necessary to render the food palatable; but fruits may be freely recommended to those who are gouty, or have a tendency to gout. Linnæus is reported to have cured himself of a long-standing gout by the use of strawberries in abundance. Water is advised as the best beverage, alcohol in all its forms being injurious, although in some cases the prescription of alcohol may become a necessity. Of wines, champagne is the most objectionable, and certain kinds of beer or pure brandy freely diluted are the least detrimental in their effect.

Dr. Ebstein awards a high place in his system for the prevention and cure of gout to physical exercise, which in all its varieties should be assiduously practised, with the single proviso that it must never be pushed to the point of exhaustion. Passive manipulation, dry rubbing with flannel, and massage are admitted to be useful, but should if possible never be allowed to take the place of bodily activity.

Finally is considered, both in the body of the work and in an appendix of additions and illustrations, the influence of Continental baths and mineral waters, for information in regard to which, as well as respecting many minor yet important details concerning diet, clothing, and so forth, we would warmly recommend our readers to this valuable treatise itself.

2. Dr. Granville in his preface modestly (almost too humbly) disclaims any pretension to writing a scholarly monograph, and apologizes for his "audacity" in daring to differ from some of the opinions expressed by Prof. Garrod in his work upon the subject, which is pronounced the best book on gout in our own, or probably in any other language. Dr. Granville considers the malady from a clinical standpoint alone, saying nothing of the bibliography, and very little of the pathology, of the disease. The first part of the book is devoted to *Facts and Indications*, whilst the second includes *Treatment and Formulæ.*

Our author appropriates a chapter to the "gouty constitution," although he declares that the observant clinician will infer its existence from the discovery of evidence of the gouty habit, rather than hypothecate the gout from a fancied recognition of the type of constitution or organic habit upon which it is supposed to depend. His conclusions in regard to certain notable peculiarities of the way in which gout is inherited have much practical value, and should be carefully considered by any physician called upon to solve the problems of diagnosis and treatment in families where the arthritic diathesis has manifested itself, or is suspected to exist.

In the treatment of an acute attack of gout, Dr. Granville recommends: First, the free use of chloride of ammonium, with chlorate of potash in dilute solution, as an efficient diuretic, which operates without increasing, but on the contrary relieving, any irritation or congestion of the kidney which has occurred. Second, the employment of iodine in the form of the tincture, with glycerine and water in large quantity. This mixture, disagreeable as it is, affords so much relief from pain after each dose that the patient will generally be anxious to repeat it, and opium or any other anodyne may usually be dispensed with. After the more urgent symptoms are relieved, a grain of quinine should be added to each dose of the iodine mixture. On the other hand, if this mode of treatment should fail from any cause, Dr. Granville advises us to fall back upon colchicum, administering the wine of the root in half drachm doses, with a saline or alkaline carbonate. Judicious instructions are given in regard to modifications of this treatment under various circumstances, and much valuable information is conveyed respecting the diet, nursing, and general management of these trying cases, which so often tax to the uttermost a medical practitioner's best skill and care.

In considering the proper regimen of a gouty patient during the interval between the two attacks, Dr. Granville contends that the attempt to prevent the accumulation of uric acid in the system by reducing the amount of raw material from which it is supposed to be manufactured is a dangerous error, and advocates for his patients as rich and varied a diet as the appetite demands or the palate desires, provided a due functional activity of the liver and abundant exercise in the open air are secured. In this view our author is diametrically opposed to Prof. Ebstein, as quoted in a previous portion of this article; and although an approval of such gastronomic liberality may be expected from the gouty patient, who is generally a *bon vivant* to the backbone, we have little doubt that in many instances at least the system so ably advocated by the German physician will win a far greater measure of success.

The latter portion of Dr. Granville's primary section is devoted to a detailed exposition of the treatment in chronic, rheumatic, retrocedent, and irregular gout, and of gouty affections of various organs, whilst the second part comprises a large number of excellent formulæ, many of which are indorsed by the author after prolonged experience in their efficacy.

3. As a record of personal observation in regard to the gouty dyscrasia Dr. Roose's book represents, he tells us, a somewhat extensive clinical experience, which appears to have led the author to conclude that functional disorder of the liver underlies the majority of gouty manifestations, and that the kidneys are only secondarily implicated. Hence, the main object of treatment in his opinion is not merely to neutralize the uric acid (which, as we have already pointed out, seems to act as a chemical poison) by means of alkalies, but also, and in an especial manner, to secure the due restoration of the hepatic functions. After a very fair account of the various theories in regard to the cause of gout, Dr. Roose enunciates his own views in a series of propositions as follows :—

"1. Uric acid in the form of sodium urate is the *materies morbi* of gout.

"2. The deposit of sodium urate in the joints is the cause of gouty inflammation.

"3. This substance is produced in excess as a result of the imperfect transformation of albuminous substances.

"4. This imperfect transformation is, for the most part, due to functional disorder of the liver, or to excessive supply of nutritive materials, or, as often happens, to a combination of these causes.

"5. So long as the excess of uric acid is eliminated by the kidneys, decided attacks of gout may be absent, but the symptoms above described as pertaining to the uric acid diathesis are liable to be present.

"6. The kidneys are apt to become secondarily affected, owing to the irritation set up by excess of uric acid, and other products of defective metamorphosis, and by deposits of urates. Primary disorder of the kidney is not a necessary factor in the production of gout.

"7. In the majority of cases of chronic gout increased production of uric acid, is associated with defective elimination by the kidneys.

"8. The symptoms of nervous disorder in gout are due to the action of the *materia peccans* on the nerve-centres."

Under the head of errors of diet as a cause of gout our author declares that, in opposition to the views of Dr. Garrod, sugar, unless in the most moderate quantities, is almost poisonous to a gouty subject. This injurious effect of the saccharine elements has been explained on the theory that sugar causes uric acid to assume a less soluble form in the human system. The amylaceous and oleaginous ingredients of food are objected to by Dr. Roose on similar grounds, no such exception in favor of fatty articles of diet being admitted, as that approved by Prof. Ebstein in his work noticed above. The action of alcohol is summed up by saying that distilled spirits and the lighter wines appear to be innocuous, as far as the production of gout is concerned, while malt liquors of all kinds and the stronger and imperfectly fermented wines (comprising port, sherry, Madeira, and champagne) play a very conspicuous part in the causation of gout.

On a subsequent page (125) Dr. Roose asserts, however, what is probably much nearer the truth, that "both theory and experience teach us that alcohol in any form should be avoided by gouty subjects." The influence of lead as a predisposing cause of gout is mentioned as a question of considerable interest, and the suggestive fact stated that even in medicinal doses salts of lead are wont to cause very marked symptoms in gouty patients.

In the treatment of an acute attack of gout Dr. Roose is of course influenced by his views as to the preponderating causal influence of hepatic disorder, and usually commences with a mercurial purgative, followed by colchicum in the customary mode. No mention is made of the administration of iodine, so highly lauded by Dr. Granville, but great benefit is claimed from the employment of extract of belladonna, dissolved in diluted glycerine and applied locally upon cotton-wool to the affected joints.

J. G. R.

ART. XXVII.—*Diseases of the Spinal Cord.* By BYRON BRAMWELL, M.D., F.R.C.P. (Edin.), Lecturer on the Principles and Practice of Medicine in the Extra Academical School of Medicine, Edinburgh. Second edition. Edinburgh: Young J. Pentland, 1884.

WE are not surprised that a new edition of this valuable work has been called for so soon. The orderly and systematic arrangement and the numerous and beautiful illustrations make it a book particularly welcome to the practitioner and student. That French, German, and Russian editions have already appeared indicates the estimation in which it is held in Europe, and is a compliment not often paid to English authors. The edition shows careful revision. A great improvement has been made in placing the pathology of individual lesions under the special diseases, and a large number of new wood-cuts and colored lithographs have been added. But the most important change is the insertion of sections on functional diseases and on concussion of the cord. The paraplegias depending upon hysteria, malaria, alcohol, reflex paraplegia, neurasthenia spinalis, spinal irritation, and Reynolds's "Paraplegia depending upon Idea," are fully considered, and valuable suggestions given upon diagnosis and treatment. The section on concussion of the spine deals particularly with the symptoms resulting from railway collisions, and contains a most careful analysis of the condition known as railway spine as well as the method to be employed in the examination of these cases. To railway surgeons this chapter will prove especially interesting, and the systematic manner in which the subject is treated should be of great assistance in the study of these troublesome yet important cases.

As a text-book for the student, and as a guide to the practitioner in unravelling obscure spinal cases, Dr. Bramwell's work has no equal.

W. O.

Art. XXVIII.—*A Manual for the Practice of Surgery.* By Thomas Bryant, F.R.C.S. Fourth edition, with 727 illustrations. Pp. 1039. Henry C. Lea's Son & Co., 1885.

American surgeons and students have signified their appreciation of this work by a demand for four editions since 1879. The third American, reprinted from the third English edition, was thoroughly revised by Dr. John B. Roberts. It was "noticed" in the July number of the Journal for 1881. The volume now before us is the unaltered reprint of the fourth English edition, in which the author has advisedly incorporated many of the additions of Dr. Roberts.

Now, as at any time in the last score of years, the treatment of wounds holds a pre-eminent place among important surgical questions, and particularly is this true of the antiseptic method. Of the Listerian mode of dressing wounds, the author observes that "it has had its day, although the principle upon which it is based survives and is likely to do so." Like many opponents of the antiseptic method, Mr. Bryant is unnecessarily severe. The school of antiseptic surgeons "maintain that exploratory and operative measures which have been regarded as beyond the province of the surgeon may now be calmly and quietly undertaken with a *moral certainty* of being followed by a good result. Thus it is that they talk of cutting into healthy joints with the *certainty* that no danger will follow, and declare that great operations upon the bones of the knee may be undertaken with the feeling that in so doing we do not subject the patient 'to any risk whatever;' that a wedge-shaped piece of bone may be taken from a deformed femur with the confidence that a compound fracture so produced is perfectly safe and without risk, and, last but not least, that the peritoneal cavity under antiseptic precautions may be opened with *impunity*." "I need hardly say," continued Mr. Bryant, "that much of this is bold assertion. . . . Facts, indeed, have been employed by our self-styled antiseptic friends as legal advocates use small data which tell in their favor to support the cause they have in hand, but not as the judge who has to weigh evidence, and with an unbiased mind give judgment." Like all the opponents of the method under consideration, our author must resort to it in a modified form, and cannot refrain from recognizing its great value. "We must admit," he remarks, "that surgery is now much more successful than twenty years ago, and that of the many factors which have brought about this result, the employment of antiseptics stands foremost." . . . Indeed, the importance of the principles of antiseptic surgery can no longer be disputed, and the only differences of opinion possible concern the choice of antiseptic and its mode of application. Mr. Bryant is partial to the irrigation method, for which he uses the tinct. iodinii (1–80). After operations this is applied hot.

A chapter to which surgeons invariably turn is that devoted to injuries of the skull and its contents. In the volume before us, these injuries are treated of at considerable length, and the precepts laid down for the guidance of the practitioner are, for the most part, in accord with those generally accepted by surgical writers. Thus, trephining is advocated in all punctured fractures. In other cases of fracture, whether compound or simple, surgical interference ought not to be adopted as a rule of practice, "since experience has taught us that depressed bone *per se* may exist to a great extent without giving rise to any serious brain complications, and that when even brain symptoms follow as an immediate result of the injury they may all pass away." In compound fractures, however, associated with depression and comminution of bone, both with or without brain symptoms, the author advises the removal of loose pieces and the elevation of depressed portions. In this chapter Mr. Bryant has not incorporated the results which have accrued from the labors of Ferrier, Charcot and Pitrès, Fritsch and Hitzig, and others who have labored in the field of cerebral localization. The cerebral cortical centres that are now almost universally accepted as controlling centres for certain sets of muscles, and the well-known rules for locating them in the living for operative purposes, have been entirely ignored in the volume before us. In a general way, Mr. Bryant justifies the opening of the dura mater when no pus has been found between it and the bone, but believes that "the evidence required to sanction any incision into the brain itself in search of suppuration must be very strong."

The chapter on Lumbar Colotomy, in the edition before us, has been enriched by an analysis of 82 cases operated upon by Mr. Bryant, which were presented in a paper read before the International Medical Congress at Copenhagen. Of the 82 colotomies, 60 were performed for cancerous growths, 19 for "non-cancerous" stricture and ulceration of the rectum, 1 for volvulus of the sigmoid flexure of the colon, and 2 for obstruction due to pelvic tumors. Left lumbar colotomy was performed in 77, and right lumbar colotomy in 5 of these cases, all the latter being cancerous. 26 or 43.3 per cent. of the cancerous, and 6 or 31.5 per cent. of the non-cancerous cases with 1 operated upon for obstruction, or 40 per cent. of the whole number, died within the month. 34 or 56 per cent. of the cancerous, and 13 or 68.5 per cent. of the non-cancerous, with the case of volvulus and 1 of the cases of obstruction, or 60 per cent. of the whole number of cases operated upon, received more or less fully the benefit of the operation, surviving it from six months to fourteen years.

However inviting these results of the author may be, it must always be remembered that colotomy is an operation palliative in its nature and necessarily followed by a condition to which many patients would prefer death. It is therefore especially fortunate that excision of the rectum has recently received the attention of surgeons as an operation not only justifiable, but, all things considered, eminently successful. Whenever practicable, it should be given the preference over colotomy. "It would seem," says our author, "that about two and a half or three inches of the rectum may be removed with safety." Billroth, Czerny, Esmarch, and many other continental surgeons have demonstrated conclusively, however, that four and even five or more inches of the bowel can be removed with fair prospects of a successful result, and that the opening of the peritoneum as it is reflected on to the gut cannot be deemed an obstacle in the way of a favorable issue. Whereas, lumbar colotomy merits all the attention our author has given it; the operation of excision of the rectum as an infinitely more radical measure has not obtained a proportionate consideration at his hands. Of the two procedures, there can be little question that excision of the rectum should always be preferred save in the most hopeless cases.

As might well be expected from the pen of an English surgeon of the distinction of our author, the chapters on the surgery of the abdomen are among the most interesting and instructive of the volume. Especially is this true of those on hernia and the various forms of intestinal obstruction. On the other hand, but little notice is taken of the recent advances in the surgery of the abdominal viscera. Strange as it may appear, we could find no mention of hepatic abscesses and their treatment. Furthermore, although nearly forty cases of cholecystotomy have been recently performed, and the justifiability of the operation has been firmly established, the term is not to be found in the text or index. In strong contrast, therefore, with this want of consideration of important subjects is the chapter devoted to renal surgery, which, although concise, is fully abreast of the opinions of the most eminent writers of the day.

In the chapters on Fractures, Diseases of Bloodvessels, Surgical Pathology, and Special Surgery, very numerous additions, to which it is impossible to more than direct attention, indicate the work which has been done in revising the last edition. While this volume has essentially the scope and character of a text-book, it everywhere displays the strong personality of the author. Allusions to cases encountered by him are everywhere interwoven in the text, and it is this probably, more than aught else, which has given this work the enviable position it holds among surgical treatises. It certainly needs but little commendation from us. Having passed through four editions in England, it may be safely viewed as an enduring recognition of the rank of its author among the eminent guides of students and practitioners. J. R.

ART. XXIX.—*Health Reports.*

1. *Third Annual Report of the Provincial Board of Health of Ontario for the Year* 1884. Pamphlet, pp. 224. Toronto, 1885.
2. *Fifth Annual Report of the State Board of Health, Lunacy, and Charity of Massachusetts. Supplement containing the Report and Papers on Public Health.* Pamphlet, pp. 283. Boston, 1884.
3. *Seventh Annual Report of the State Board of Health of Rhode Island for* 1884, *including the Report upon Births, Marriages, and Deaths in* 1883. Pamphlet, pp. 409. Providence, 1885.
4. *Second Report of the State Board of Health of Tennessee. Oct.* 1880–*Dec.* 1884. 8vo., pp. 600. Nashville, 1885.

1. IN presenting its Third Annual Report, the Health Board of the Province of *Ontario* states that the work of the year has been exceedingly gratifying, and affords evidence that the broadcast dissemination of sanitary knowledge by pamphlets, health conventions, and various other means, has resulted in a more intelligent appreciation of the nature of epidemic disease, and an increased comprehension of the best means for its prevention or limitation. Satisfactory as the progress made has been, however, the recent serious and prolonged epidemic of smallpox in the adjoining province of Quebec shows that much room for improvement in this respect, among our neighbors across the St. Lawrence River, still exists. A certain amount of popular anxiety in regard to the advent of cholera, coupled with a lively recollection of the fact that the comma bacillus of Asiatic cholera first entered the continent of North America as an imported commodity, arriving at Quebec early in 1832, has probably

aided in the good work of establishing Local Boards of Health, four hundred of which have been created in Ontario since July 1st of last year. A well-founded complaint is made of the great want of proper precautions at English ports of embarkation against the carriage of disease germs by emigrants coming from infected regions on the continent of Europe, to take passage upon British ships for this country. Indeed there is great reason for us in the United States to unite with the authors of this Report in the warning that "unless greater precautions are taken at ports of departure of emigrant ships from Europe to this continent, the germs of disease not yet extinct may be imported to our shores, and, as a necessary consequence, a larger amount of additional work by the Board will be called for." The volume does not contain any essays or articles upon sanitary subjects, being made up chiefly of reports from the numerous Local Boards of Health, which, valuable as they are to the officials concerned, possess only a subordinate interest for the general reader.

2. From the *Massachusetts* Report it appears that only a few isolated cases of smallpox have occurred in the State during 1883, and the prophylactics of vaccination and prompt isolation have been so successfully applied that only five deaths from variola are recorded. Scarlatina has prevailed with considerable uniformity throughout the year, but the total mortality is much less than the average for the past twenty years. The deaths from diphtheria have been fewer than in 1883, and fewer than in any year since 1874. The improvement in regard to these contagious maladies is no doubt largely due to the gratifying fact that greater care is exercised against their spread in schools throughout the State, certificates of health being now usually required previous to the readmission of children who have been ill with contagious disease. The Act of Legislature passed in March, 1884, under which this important advance in school hygiene is enforced, also very judiciously prohibits the attendance of a pupil at the public schools while any member of the household to which such pupil belongs is sick "of smallpox, diphtheria, or scarlet fever, or during a period of two weeks after the death, recovery, or removal of such sick person."

The first paper is an essay on *Tubular Wells and Wells in General as a Source of Water-Supply for Domestic Purposes*, by J. C. HOADLY, and gives much needed information in regard to the dangers of drinking-water pollution. This article is illustrated by numerous diagrams, indicating the effect of pumping water from wells upon the circumjacent ground-water, and tending to impress upon the reader's mind very strongly the importance of discharging at much greater distance than is usually allowed from every well used for domestic purposes all causes of contamination.

The Sanitary Condition of Somerville, by JOHN F. COUCH, M.D., gives a very thorough and complete report of its subject-matter, and exhibits evidence of much faithful and diligent sanitary work, the efficiency of which is proved by the almost regular decrease of the death-rate from 24.3 per thousand in 1872, to 17.1 per thousand ten years later.

The report in regard to the *Inspection of Food and Drugs* is made up of the results obtained by Dr. E. S. WOOD, Analyst of Food, Dr. B. F. DAVENPORT, Analyst of Drugs, together with those of Dr. CHARLES WARRINGTON, of Boston, and Prof. C. A. GOESSMANN, of Amherst, Analysts of milk and its products. Prof. Wood reports that he has received and examined about six hundred samples of various articles of food, nearly half of which proved to be more or less adulterated. During the year a gradual improvement of the specimens submitted has been noticed, and among other signs indicating a wholesome dread of the law is the fact that many brands of ground spices, formerly sold as "strictly pure," are now marked "compound." Many of the common articles of diet, notably the cereals, are happily quite free from fraudulent sophistication. Whilst a large amount of fraud is thus shown to exist, it is gratifying to observe that poisonous compounds, offered as imitations or substitutions, were rarely discovered. The investigation in regard to milk shows that adulteration is much less common in the western part of the State than in the larger cities and towns of the eastern portion. In Boston and neighboring towns only about twenty per cent. of the samples came up to the high official standard of thirteen parts per hundred of total solids, and in some instances the amount of dilution was shamefully great. Dr. Davenport, drug analyst, states that he has examined six hundred and eighty samples of "U. S. Pharmacopœial drugs," and found over forty-one per cent. were adulterated. These specimens were carefully collected from all parts of the State in such a manner as to avoid errors as far as possible, and many of the results obtained are of sufficient interest and importance to be condensed for the benefit of our readers, did space permit.

A short report on *Trichinosis* based on four supposed cases of the disease, none of which proved fatal, is followed by an essay on the *Sanitary Condition of Nantucket.*

The concluding paper by Prof. E. S. Wood, upon *Arsenic as a Domestic Poison*, is one of great value, and is illustrated in the most practical way imaginable by an object lesson of six pages, displaying thirty-three strips of paper, one of calico, and one of Turkey-red cotton fabric, all containing arsenic in varying quantities up to 55.88 grains per square yard. None of the more atrociously poisonous wall-papers are exhibited in this highly instructive series of samples, partly because the binding of them in a previous report by Dr. Draper gave rise to extremely disagreeable results among the bookbinders who handled them. Dr. Wood gives numerous illustrative cases of arsenical poisoning from such wall decorations, pointing out also the danger of using these colors for kindergarten papers, in the manufacture of theatre or other tickets, in glove or hat linings, stockings, and other articles of clothing, and in some rare instances in confectionery. The method of determining the presence of arsenic resorted to by our author was the usual Marsh's test, a piece of the suspected paper about four inches square being cut up into small fragments, heated with pure concentrated sulphuric acid to destroy all the organic matter, exhausted with distilled water, and the filtered solution, which will contain nearly all the poisonous ingredient, introduced directly into a Marsh's apparatus. As a means of awakening attention to the peril from wall-papers, which present, as they often do, none of the bright green tints which are popularly supposed to be the chief danger signals, we welcome this essay of Prof. Wood as an important contribution to the literature of the subject, and would hail with pleasure its dissemination throughout the whole community in some more popular form than in a bulky official report.

3. The *Rhode Island* report shows an improvement in work of the registration department, not only by being more complete in regard to the details of births, marriages, and deaths, but also in respect to that great refuge of ignorance and incompetence in diagnosis, the group of cases in which the cause of death is recorded as unknown. No severe epidemic of disease has occurred in Rhode Island during the past year, and the

comparatively small number of cases of contagious or infectious maladies has usually presented a mild form. Increasing attention appears to have been bestowed upon the important subject of contagious diseases among domestic animals which may be transmitted to man, and entail a vast amount of injury to human health. In tabulating the mortality reports the nosological arrangement is founded upon the British nomenclature of diseases, so that some further progress is here made towards that complete uniformity of classification which, it is ardently hoped, will obtain throughout English-speaking countries as soon as the long looked-for report from the committee of the English Royal College of Physicians is promulgated. In common with many other health authorities, the Rhode Island Health Board issued a circular, reprinted in this report, containing concise, clear, and correct *Suggestions in Relation to Prevention and Restriction of Asiatic Cholera*, in which the great duties of strict quarantine to exclude the germs of cholera, and the prompt abatement of cholera-breeding places, where propagation of the disease poison is favored by decomposing organic matter and impure air, are strenuously urged upon municipal authorities as well as upon every good citizen.

From the able and voluminous report of Samuel M. Gray, C. E., of Providence, in regard to *Sewerage System and Sewage Disposal*, it appears that, after extended personal investigation of the methods now in vogue abroad, the author recommends that an improved system of intercepting sewers shall be constructed in Providence, by which the sewage will be conveyed to a suitable point, and there treated with chemicals in such a manner as to precipitate the suspended materials, and clarify the effluent, so that when discharged into deep water it will be practically innocuous. His reasons for advising this process are that he is confident the foul fluids can be rendered harmless before they are emptied back into the river, and that the purification can be accomplished at less expense than by the method of irrigation, because from careful and extended surveys he is convinced that the large amount of land required for suitable sewage farms cannot be purchased at a reasonable cost, within moderate distance of the city. The experiment of providing for an estimated daily flow of sewage, amounting to three millions of gallons, by engineering works proposed to cost over three and a half millions of dollars, will be observed with great interest by sanitarians, particularly as the various precipitation processes, although now in apparently successful operation in certain English towns, have failed to win the general approval of those most skilled in sanitary engineering.

The concluding paper is a reprint of the preliminary report on *Disinfection and Disinfectants* lately made by the committee of the American Public Health Association, which is justly indorsed as the best guide we possess at present in the practical work of destroying the *materies morbi* of various contagious or infectious diseases.

4. The scanty appropriation made to the *Tennessee* Board of Health has apparently prevented the publication of any annual report since the year 1880, so that the present volume comprises the record of proceedings for over four years. This account affords convincing evidence of the excellent sanitary work accomplished by the members, both individually and collectively in their official capacity, and constitutes a mass of eloquent testimony in favor of liberally sustaining the Board of Health. This, we trust, the intelligent community, for whose benefit these arduous labors in the cause of public hygiene have been so nobly carried on, will

appreciate in that substantial manner which can alone crown such beneficent efforts with complete success.

The first paper is a well-written article on *School Hygiene in Tennessee*, by DANIEL F. WRIGHT, M.D., of Clarksville, member of the State Board of Health and chairman of its committee on the subject. The author evinces an admirable appreciation of the vital importance possessed by a systematic attention to the health of school children, which class comprises to-day nearly four-fifths of the rising generation, the hope of America, and his recommendations are well worthy of careful consideration by every teacher and parent in the State. In his report on the *Prisons in Tennessee*, Dr. P. D. SIMS, of Chattanooga, makes a strong plea against the system, now in vogue, of farming out convict labor, which, as at present enforced, entails upon the prisoners the startling death-rate of one hundred and forty-seven per thousand annually. Dr. G. B. THORNTON, M.D., of Memphis, presents an able report on *Epidemic and Contagious Diseases*, as they prevailed in Tennessee during 1881–1882, which, however, is not as complete as is desirable, in consequence of deficiencies in the statistics furnished, with the exception of those forwarded by Dr. Kemp of the English settlement of Rugby. This record is in regard to an outbreak of typhoid fever which prevailed at Rugby, and affected the inhabitants of the place in thirty-five instances, twenty-seven of which were traced beyond a doubt to the contaminated well water of a tubular well belonging to the chief hotel. A timely paper on *Bovine Tuberculosis*, by Dr. J. D. PLUNKET, of Nashville, judiciously urges upon the community a speedy adoption of measures for avoiding infection from "this fruitful source of human disease and death." Dr. Plunket also furnishes an article on *Ozone and its Relations to the Public Health*, which is illustrated by a lithographed ozone scale, and is well calculated to promote that systematic observation of the effects of this powerful but mysterious agent, as developed over wide areas of country, and under different conditions of atmospheric pressure, humidity, and so forth, which is much desired by meteorologists. A valuable essay on *Gulf Coast Quarantine*, giving an account of the energetic and successful efforts made to prevent the spread of yellow fever or other contagious disease up the Mississippi Valley last year, is contributed by G. B. THORNTON, M.D., of Memphis, and this highly creditable volume concludes with a complete *Analytical Index*, carefully prepared by MARY M. LINDSLEY, of Nashville, which largely adds to the usefulness of the entire work. J. G. R.

ART. XXX.—*Hay Fever, its Etiology and Treatment, with an Appendix on Rose Cold.* By MORELL MACKENZIE, M.D., pp. 54. London: J. & A. Churchill, 1885.

THERE are many positions encountered in the writings of medical men which by virtue of their common acceptance have come to be regarded in the light of axiomatic truths either from slavish adherence to authority or indifference to inquiry into their claims to scientific recognition. In this way transmission of error is often encouraged by those who, bowing with reverence before the dignity of age and established usage, unconsciously receive the fallacies taught in school and text-book as primal or fundamental principles of their medical knowledge. The emancipation of the professional understanding from the error of first impressions derived from the dogmatism of teacher and writer is a process of tardy evolution, and it is therefore easy to see how false doctrine universally received and taught by medical men should, when announced by them to the laity, find ready access to the unprofessional mind and influence the popular judgment. The general popularity of the pollen theory of the disease falsely called "hay fever" affords a striking illustration of the truth conveyed in the above reflections. It has been universally taught for years that this affection is due to some mysterious agency contained in the granules of pollen, and the laity have been disciplined by their medical advisers into the belief that the curious *ensemble* of its phenomena is in some inexplicable manner produced by the emanations from grasses and flowers. There is a certain charm about this superstition which commends it at once to the fancy. It is seemingly so natural and plausible to connect the phenomena of the disease with the flowering of certain plants, and the mind so naturally gravitates toward the easiest and most poetical explanation, that it is not surprising that this view should have obtained such universal dominion over the thoughts of the profession and laity. Even those who have in recent years partially forsaken the beaten track into which it has led them are still to a great extent under the influence of its power, and it is therefore not unnatural that not only the profession, but the laity, dominated by the precepts of a doctrine of almost universal acceptance, should receive the alleged relation of the pollen granule to the phenomena of "hay fever" as a fundamental truth, and rest content with the lazy explanation of the affection which it affords.

During the past few years this theory has been slowly driven to the wall chiefly through the investigations of American observers, and new conceptions of the disease have arisen, which, if they have not reached the solution of its pathology, have at least placed this hitherto incurable complaint on the list of curable affections.

The essay before us is an apology for the pollen theory, and challenges attention, not on account of originality in the subject-matter, for the line of reasoning is essentially the stereotyped one so long employed by the advocates of this view, but because a representative man, like Dr. Mackenzie, has undertaken to lead the forlorn hope of a dying hypothesis against the host of facts which are daily marshalling themselves against it.

In view of its many inconsistencies and contradictions, and in the light of recent observation, the refutation of the pollen theory seems a work of supererogation, but, in justice to our distinguished author, we will call attention to a few of the many unanswerable objections which bear directly on his contention.

The orthodox articles of Dr. Mackenzie's accepted faith are embraced in the following fundamental propositions: (1) That the disease is produced by the pollen of grasses and flowers, the granules of which are endowed with a peculiar vitalized principle which possesses "exceptional qualities . . . as a living organism capable of undergoing some degree of development when deposited on mucous membranes more or less exposed to the air;" (2) that, as the pollen granules containing this vital principle are only one-tenth the size of the blood-corpuscles, it is highly probable that they enter the bloodvessels by actual penetration of their walls, and it is not improbable that the *malaise* experienced in hay fever is due to the presence of this granular matter in the general circulation. In accordance with this view, he has selected as the motto for his essay the well-known Virgilian proverb "*latet anguis in herbâ.*" At the same time, he confesses, with those he follows, that the persons liable to be thus affected by pollen are possessed of a peculiar idiosyncrasy, although upon what the latter depends is "quite unknown." In other words, Dr. Mackenzie advocates the theory which derives its popularity mainly from the writings and experiments of Blackley, in whose footsteps he closely treads.

Let us consider these positions in detail, and in the first place inquire, "Is there anything in pollen to produce the disease in question?"

Dr. Mackenzie makes the unqualified assertion that "Blackley's experiments leave no doubt that the cause of hay fever is *the action of pollen on the mucous membrane.*" To this statement we must respectfully, but emphatically demur. While due credit should be given for the painstaking way in which Mr. Blackley conducted his experiments, it must be at the same time acknowledged that they fell far short of the accomplishment of the object for which they were carried out. They prove one thing, and one only, that in an isolated case, and that his own, at least pollen *may act as an exciting cause of the paroxysms* of the disease. They by no means show, as Dr. Mackenzie and others wrongly infer, that pollen is the sole exciting cause of the paroxysm, and that the latter may not be produced by heat, light, and other external agencies. The negative effects of heat, light, and ozone in his own case are utterly valueless in view of the demonstrated fact that these agents excite the paroxysm in many other individuals. So far from proving that "hay fever" is due to the action of pollen on mucous membranes, they fail to throw any light whatever upon the true cause of the affection. It is not our object in this review to expose the many vulnerable sides of Blackley's work, which is so often quoted, but apparently so rarely read. His conclusions have been handed down from author to author as *ex cathedrâ* utterances from which there is no appeal. While his experiments were carried out in the first instance presumedly in a strictly scientific spirit, it is sufficiently evident, from his subsequent publications, that his mind was so swayed by the pollen theory as to render it unreceptive to new facts and new discoveries. Neither he nor his followers attempt to reconcile the inconsistencies and contradictions which are the logical outcome of his hypothesis. As a specimen of his line of reasoning, the powerful blow which Beard dealt the pollen theory is met with the observation that the gentleman is a member of two neurological societies, and that, therefore, the researches of this notoriously painstaking and accurate observer are open to serious objection.

While Blackley showed that in his own case pollen acted as an exciting cause of the paroxysms, it has, on the other hand, been conclusively demonstrated that there are a host of other agencies, external and internal, which produce exactly the same result. Our own observations, based on the analysis of a large number of cases, teach (1) that there is practically an infinite number of causes which may precipitate the attack; (2) that one irritant is of itself insufficient to produce the paroxysm, the latter being only possible from abnormal functional activity of the nerve-centres, inherited or acquired; (3) that in the majority of cases the paroxysms are induced by a variety of agencies differing entirely in character and mode of operation; even in those cases in which there is apparently only one exciting cause, it will generally be discovered that there are conditions which bring about the attack other than the alleged solitary exciting cause; (4) that the latter may be operative only during certain periods of the year, or may provoke a paroxysm, without regard to season, whenever applied; (5) that it may be said, in general, that the exciting cause may produce its effect, by direct or indirect (reflex) irritation of the sensitive nerves of the nasal and other mucous membranes; through olfactory impression or through simple association of ideas; or the same result may be brought about by physical or mental over-exertion or emotional excitement; (6) that typical paroxysms occur in some persons at any season of the year, from a variety of causes, but especially from sudden changes in the temperature, or from electrical disturbances of the atmosphere; (7) that paroxysms may be produced as reflex phenomena from irritation of a distant organ, or from some excitation starting in the nerve-centres themselves; (8), finally that pollen is only one of a host of exciting causes, and there is reason to believe that in some cases in which it is supposed to be the excitant, it has little or no influence at all.

As an illustration of the effect of a purely psychical impression in the production of the paroxysm, we would call attention to our experiment with an artificial flower related at the last meeting of the Laryngological Association. Dr. Mackenzie alludes to an exceedingly interesting case of his own, which supports the views concerning an occasional psychical element in the etiology, although he gives to it an interpretation which, in our opinion, is unwarrantable. A victim of "hay fever," after a visit to the Royal Academy, where she had seen a highly realistic hay-field of Mr. Vicat Cole, had a severe attack of the disease. Dr. Mackenzie hesitates between the natural explanation afforded by the association of ideas, and the possibility of her having passed a hay-cart on her way home; "the latter solution, if more prosaic," is also, according to him, "more probable."

There is another case in literature identical with that mentioned by Dr. Mackenzie, and the two open our eyes to the fact that the association of ideas sometimes plays a more important part in the production of a paroxysm than the supposed vital property of the pollen granule.

There is absolutely nothing in pollen to cause the group of phenomena known as "hay fever." To urge the existence of some inherent vital principle which develops a peculiar power when deposited on a mucous membrane is one of those gratuitous assumptions which from the insecure foundation upon which the pollen theory rests, and which have no scientific reason for their acceptance. It is certainly more rational and more in accordance with the facts in the case to infer that the influence of local irritants is mechanical or chemical, and that their power to excite a paroxysm depends upon their physical properties, and the length of their sojourn in the nasal chambers. The glutinous character of some substances, the irregular surfaces of others, will give rise, for example, to more prolonged irritation than substances of smooth contour and less tenacious qualities which are readily swept out of the nostrils. As the irritation of worms or morsels of undigested food retained for a long while in the gastro-intestinal canal give rise to convulsions, cough, and other reflex disturbances through the constant irritation of the readily impressionable nerve-centres of the infant, so the prolonged excitation of the hyper-sensitive vaso-motor centres of the "hay fever" sufferer by the external irritant may evoke the vaso-motor disturbances which are the leading characteristics of the complaint under consideration. The cause of the convulsion is not the worm or the undigested particle of food, but the prolonged action of a local irritant upon a naturally excitable nervous organization.

While nearly everybody is exposed to the action of pollen on the mucous membranes, comparatively few suffer from the disease, which latter is, moreover, most commonly met with among those least subjected to the alleged exciting cause; for, although confined to no particular class, it is a well-known fact that it is most frequently observed in the cities, and is comparatively rarely encountered among the agricultural population. The explanation of this consists in the fact that the latter are less predisposed to catarrhal affections in general, and disorders of the nervous system. At least, this is obviously more satisfactory than the position that constant exposure to the exciting cause produces tolerance. The occurrence of the disease in situations and under conditions in which the presence of pollen is out of the question strongly militates against the theory that pollen is the sole exciting cause. The relief or immunity from the disease found by the seashore and on the mountain top is readily explained by the well-known beneficial effects of these regions on catarrhal and nervous affections. In other words, the influence of locality upon the disorder is climatic and tonic, and has little to do with a diminished amount of pollen in the atmosphere of a given region. The depressant effect upon the nervous apparatus of the heated land breeze is probably more potent in the production of a paroxysm than the emanations that may be carried along with it. The occurrence of the disease far out at sea has been met by the assumption that clouds of pollen must have been wafted thousands of miles to the ship that carried the unfortunate victim, or that in the unfurling of the sails "a large quantity of pollen collected in their folds was set free," and is illustrative of the form of reasoning by which the advocates of the pollen hypothesis seek to escape from their dilemma. Indeed, the whole line of defence adopted by the pollen theorists is assumptive rather than demonstrative or argumentative, and consists in an apparent endeavor to involve the logic of facts in a tissue of seemingly plausible suppositions.

Equally unanswerable objections to the pollen theory are those which relate to the influence of race, education, modes of life, climatic influences, geographical distribution, etc., while its inconsistency is shown in the fact that while the disease is supposed to be due exclusively to the emanations from plants, it is at the same time universally contended that the affection is one confined to the social and intellectual life of the present century. And so we might go on to enumerate many other facts fatal to the assumption that the disease is due to pollen, such as its complete disappearance in some summers, the non-correspondence of the hay season in America and the period of the attack (Wyman), the marked periodicity of the attack apart from the possible presence of pollen, its regular appearance at a certain hour and on a certain day, pointing to derangement of the nervous system, etc. etc. The alleged exact correspondence of the onset of the disease and the flowering of certain plants is unfortunately more apparent than real, and, according to our observation, the period of attack is related more to moisture or heat, or both combined, tò rapid temperature changes, and to other thermometrical and barometrical conditions than to the presence of pollen in the atmosphere.

It will thus be seen that the influence of pollen is narrowed down to a very contracted sphere—that it is simply one of an indefinite number of external agencies which are capable of producing a paroxysm, and that there are excellent grounds for the belief that in many cases in which it is assumed to be the exciting cause, it has little or no influence at all except through the association of ideas.

Let us turn now to that portion of our author's creed which relates to the penetration of the vessel walls by the pollen granules and their accumulation as foreign matter in the blood. We cannot contemplate this proposition without an involuntary shudder, especially when we view it in the light of a possible destroyer of some of our most pleasant relations with the outer world. It is but just to Dr. Mackenzie to say that this luminous idea originated in the brain of a Mr. Wright Wilson, who some years ago flashed across the literary horizon in that highly instructive portion of the *London Lancet* devoted to notes and queries from correspondents. Dr. Mackenzie seems to have been the only mortal who caught the heavenly vision, and to him therefore belongs whatever credit attaches to the discovery of Mr. Wilson and his theory. As far as our knowledge goes, Mr. Wilson and Dr. Mackenzie are the only authors, living or dead, who have gravely announced their belief in this proposition, and we hazard the conviction that, upon reflection, the latter will leave to the former the exclusive honor to which he is most justly entitled. We even venture to predict that in the coming ages—ay, to the end of time—Mr. Wilson will remain the solitary champion of an idea which, for fertility of fancy and perfect independence of natural law, shines above all other such conceptions.

" . . Velut inter ignes
Luna minores."

Dr. Mackenzie characterizes as "zealous bacteriomaniacs" those who seek in specific organisms the cause of the affection under review. If the germ-theorists be in truth "bacteriomaniacs," under what variety of mania do those fall who attribute such terrible properties to the innocent pollen granule?

While this remarkable theory may be regarded as illustrative of the extent to which the pollen advocates allow themselves to be carried by their dominant idea, it must nevertheless be confessed that it opens up an unending vista of possibilities to the speculative eye of the imagination. Through ciliated epithelium, basement membrane, and vessel wall, the dreadful vitalized amœboid pest of the summer months is launched into the general circulation. Does it feast on the nuclei of the white corpuscles as its legitimate prey, or does it seek its pabulum in the more organized and nutritious protoplasm of their redder and more numerous companions? Is it carried into remote organs on the crest of the serous wave, or is it whirled through the circulation on the back of the red blood-cell? Is the dyspnœa of this disorder due to pollen emboli in the lungs or to granular invasion of the respiratory centre? Are we at last to realize the poetic conception of

". . Quick effluvia darting through the brain,
Die of a rose in aromatic pain"?

The solution of these and similar problems must be unfortunately deferred until a time when the human mind is ready for the conception of Mr. Wilson, when the diagnosis of the affection shall be made with the microscope, and when the blood-stained pollen granule will rank with the tubercle and comma bacillus as a priceless legacy of medicine to man.

We regard it easy of demonstration that pollen or any other form of matter is insufficient *of itself* to produce the disease or excite its paroxysms. The cause of the affection must therefore be sought, not in the outer world, but in some personal susceptibility to certain forms of irritation—some morbid condition of the system either as a whole or in part. While it is undoubtedly true that the inhalation of external irritants—and pollen is only one of a host of such substances—acts as an exciting cause of the paroxysm, it is at the same time beyond question that careful inquiry will discover its influence to be purely secondary or accidental, to be dependent upon some local or constitutional condition. The solution of the question lies then in the direction of some localized or systemic derangement of the subject himself.

That the development of the affection presupposes some morbid condition pertaining to the individual seems almost evident to intuition, and it is therefore surprising that its essential cause should have been so long sought for in objects derived from the external world. Even the most enthusiastic advocates of the theory of external causes are forced to admit an essential predisposing influence without which the exciting cause is inoperative, and in its admission they unwittingly wreck the theory they attempt to defend. Blackley himself acknowledged a special predisposition or idiosyncrasy, and Dr. Mackenzie, while in one portion of his essay advocating the pollen theory, pure and simple, in another announces his belief that the affection is an idiosyncrasy, that it is characterized by and leaves behind it no structural lesion, and is therefore destitute of a pathology!

The confession that the disease is an idiosyncrasy is inconsistent with the tenets of the pollen theory as formulated in the two main propositions of our author's contention,—is incompatible with the assumption that the disease is produced by the action of a peculiar vitalized principle (resident in pollen) upon the mucous membrane. If it be in truth an idiosyncrasy or innate peculiarity in the sense used by Dr. Mackenzie, it follows that the pollen theory is not only unnecessary, but fallacious. The admission of idiosyncrasy as the essential factor is a practical recognition of the inadequacy of the pollen speculation and a virtual surrender of the question. The explanation of the disease by the theory of idiosyncrasy and its explanation by the pollen theory represent two distinct and opposite ideas, two separate and antagonistic hypotheses. We fail to see, therefore, how this view, which may be appropriately termed the botanico-psychological theory, and which is formed of two mutually destructive propositions, brings us any nearer the solution of the pathology of "hay fever."

Idiosyncrasy is a word, not an explanation, which practically conveys no definite idea concerning the essential nature of the disease, and is tantamount to a confession of "learned ignorance." In a former communication, we observed that, when certain morbid phenomena were inexplicable by known pathological laws or did not come within the range of speculation based on experimental research, the term idiosyncrasy was sought as a convenient refuge for acknowledged ignorance. Dr. Mackenzie objects to this on the ground that the term is, on the contrary, "a convenient word to express certain series of phenomena which have not been explained." Now, as "idiosyncrasy" stands for a condition of which we have no knowledge, and of which we can form no conception, it involves the idea of hopeless ignorance. If we have no conception of a supposed state, it is idle to attempt its explanation by a mere word—an empty term, which, although suggestive in one respect, is at the same time a terse, emphatic way of expressing a defect in our knowledge and observation, and carries with it the inevitable confession that the matter to be explained is inexplicable. We consider, therefore, the use of the term employed by us and that cited by Dr. Mackenzie to be practically equivalent to the terms of an equation which will be found upon analysis to be equal to each other. It seems scarcely necessary to linger thus upon a matter so self-evident, but we cannot refrain from calling attention to the following words of Locke as pertinent to the subject of the present inquiry: "He that knows not what he himself meant by a learned term, cannot make us know anything by his use of it, let us beat our heads about it never so long. Whether we are able to comprehend all the operations of nature and the manners of them, it matters not to inquire, but this is certain, that we can comprehend no more of them than we can distinctly conceive, and, therefore, to obtrude terms where we have no distinct conceptions, as if they did contain, or rather conceal something, is but an artifice of learned vanity to cover a defect in an hypothesis or our understanding."

Dr. Mackenzie defends the idea of idiosyncrasy by means of illustration and comparison, but it should be remembered that the former is not explanation, the latter not argument. That Julius Cæsar Scaliger turned pale at the sign of a water-cress, that some persons are taken with nettle-rash after the ingestion of fish and fruit, certainly does not bring us nearer the conception of idiosyncrasy, much less the complicated etiological relations of "hay fever." Neither does the comparison instituted by Marsh between the effects of the poison-oak and those of the pollen granule throw any light upon the subject, for between the two there is neither parallel nor analogy.

To set aside, therefore, the important internal factor in the etiology of the affection, wherein the whole solution of the question lies, under the specious terms, special proclivity or predisposition, individual peculiarity or idiosyncrasy, is virtually equivalent to saying that we have no sufficient explanation to offer, for, as Dr. Mackenzie himself justly remarks, "it would cease to be an idiosyncrasy if a satisfactory explanation could be arrived at." The more we reason in this direction, the more involved the subject becomes, and we are therefore not surprised that Dr. Mackenzie, weary of involution and obscurity, finally surrenders the whole ground in the following honest sentence: "Nevertheless, it must be freely admitted that no theory explains why pollen should prove a highly exciting substance to the mucous membrane of some persons, and not to others." "Hay fever" is not an idiosyncrasy, but a disease—a definite morbid state, the elucidation of whose phenomena must be sought in the study of pathological law, and not in an inquiry into the process of plant reproduction. But, it may be naturally asked, Is there any explanation of the phenomena of the disease which is better than that of an assumed "idiosyncrasy"?

Let us search for the answer to this question in the literature of the past decade. In 1876, Dr. George M. Beard, of New York, wrote a work on "hay fever," based upon carefully collected statistics, in which he surveyed the problem from a standpoint entirely different from that taken by previous investigators. As the result of his observations and inquiries, conducted in an accurate, scientific manner, he pronounced "hay fever" a functional disease of the nervous system, closely allied to sick-headache.

Its alleged almost invariable appearance in the higher walks of life, and notably in those of superior intellectual attainment, together with its assumed absence among inferior races, was dexterously wrought by him into the conception that the affection is the offspring of a higher civilization, the outcome of a hypersensitive nervous organization, the result of the enervating influences of nineteenth century social and intellectual life. While he does not explain in what such a neurosis consists, while his researches and conclusions are open to fair criticism, they nevertheless threw a new light upon the subject, and opened up a broader and more scientific pathway of research. Whatever he failed to do, he established the important fact, that an important factor, if not the chief in the disease resides in some imperfectly defined condition of the nervous system. Hay fever, according to Beard, is the complex resultant of a number of different external exciting causes (30) acting upon a nervous system debilitated by the injurious influences of modern social and intellectual life.

Five years later another important fact in connection with the disease was brought to light by Dr. Daly, of Pittsburgh, who showed that in a fair proportion of cases there is local disease of the nose and nasal pharynx (from simple hyperæsthesia to pronounced structural changes, such as hypertrophic catarrh, polypi, etc.), without which the exciting cause (pollen, bacteria) is innocuous, and that the cure of the affection may be accomplished through removal of the local intrinsic condition (by cauterization with acid, electric cautery, etc.), a position which he established by most convincing practical proof. To this observer belongs the credit of formulating the treatment of the disease by measures addressed to the nasal and nasopharyngeal chambers. According to Daly, we are only justified in looking upon "hay fever" as a neurosis when the affection persists after removal of the local nasal disease. Daly attempted no explanation of the mechanism of the disease, but simply announced a clinical fact and the treatment based upon it.

The following year, Dr. Roe, of Rochester, published the successful results of his treatment of the disease by the operative method, and related a number of cases in which a cure had been effected. According to him, the affection is due to the action of pollen upon the nasal mucous membrane, which in some persons is rendered peculiarly susceptible by active or latent disease of the naso-pharynx associated with hypertrophic catarrh of the nasal passages. The asthma and other manifestations of the paroxysm are due, he believes, to reflex congestion of the mucous membranes of the several organs in which their effects are manifested. While Dr. Roe believes the exciting cause to be pollen, he at the same time contends that, in order to the production of a paroxysm, "latent or active," nasal disease must be present, that the nervous symptoms are secondary to the hyperæsthetic condition of the nostrils, and that the latter is not the effect but the cause of the neurotic feature of the disease.

In the same year we published the results of some experiments made by us with reference to the localization of reflex sensitive areas in the nasal passages, which, we venture to believe, throw some further light upon the subject. These observations led us to the belief that the area most sensitive to reflex producing impressions is represented by that portion of the mucous membrane which covers the turbinated corpora cavernosa, that reflex acts are only exceptionally awakened from irritation of other portions of the nasal fossæ, and that all parts of the erectile area are not equally susceptible to irritation, the most sensitive spots being located in the mucous membrane covering the posterior extremity of the inferior turbinated body and the septum immediately opposite. These views of the sensitive area were opposed by Dr. Hack, of Freiburg, who maintained that all reflexes arise from congestion of the cavernous tissue of the anterior end of the inferior turbinated bone. The views of Hack on "hay fever" are similar to those of Daly and Roe. According to him, two factors are necessary to the paroxysm, a hyperæsthetic condition of the terminal filaments of the fifth and olfactory nerves and an increased irritability of the cavernous tissue, caused, as a rule, by local nasal disease, and he inclines to the belief that the neurasthenic symptoms are secondary to the nasal affection.

In 1884, a still more exclusive view was put forth by Dr. Harrison Allen, of Philadelphia, who held that the affection depended solely upon obstruction or tendency to obstruction in the nasal passages; he also called attention to the fact that (in his experience) in the sufferers from this disease, the inferior turbinated bones lie well above the floor of the nostril, a condition which subjects the mucous membrane covering them to additional irritation from external causes. These observations of different physicians, working independently of each other, viewing the subject from different standpoints, while not perfectly harmonious, nevertheless present a singular unanimity in their recognition of the necessity of therapeutic measures addressed to the nasal passages as a prime factor in the treatment of the disease. While they render it probable that certain states of the nasal passages are necessary to its production, they do not demonstrate the fact that local nasal disease is the sole excitant of the paroxysm. The views given above have been confirmed by the clinical experience of a number of physicians, among whom may be prominently mentioned Drs. Sajous, of Philadelphia, Bosworth, of New York, and Ingals, of Chicago. Several months after the publication of Dr. Allen's views, we endeavored to reconcile the discrepancies met with in the results of different observers, and advanced the theory which we give here in brief:—

According to our conception, as outlined in several articles published during the last few years, the so-called nasal reflex neuroses, whether taken singly or collectively, as in the case of the *ensemble* of phenomena known as "hay fever," may be regarded as the Protean manifestations of a morbid condition to which we have given the name *Rhinitis Sympathetica*, and which is characterized by a hyperæsthetic condition of the vaso-motor nerve-centres linked to a peculiar excitability of the nasal cavernous tissue. For, if we inquire what condition or conditions is common to them all, and what morbid process is capable of producing them either singly, or in combination; how phenomena apparently so widely different in character and anatomical sphere of operation may be traced to a solitary source, we find the answer in certain more or less clearly defined changes in the nasal apparatus and in a certain exalted state of the sympathetic nervous system, to which latter we instinctively turn as the organ most conspicuously concerned in the evolution of purely reflex acts. In whatever relation the local nasal affection and the condition of the sympathetic stand to each other in the matter of cause and effect, they must both be regarded as inseparable factors in the production of the phenomena under consideration. It matters not to what hypothesis the path of speculation may lead. Of this we can be reasonably sure, that in order to the production of the characteristic symptoms of this disease, a certain excitability of the nasal passages is necessary, *plus* an exalted state of the central nervous system.

From our present knowledge of the disease, it seems difficult to escape the conclusion that its pathology is intimately interwoven with a morbid condition of the vaso-motor sympathetic, and probably a hypersensitive state of the nerve-centres themselves. When we recall the fact that in the famous section of the sympathetic in the neck by Claude Bernard symptoms similar to, or closely allied to the phenomena of hay fever were produced; when we reflect upon the results reached by Prevost in his experiments on the spheno-palatine ganglion, is there not a clue to lead us through the labyrinth of our difficulties to a rational solution of the question? Whatever be the essential cause of the disorder, do not its phenomena point directly to a circumscribed disturbance of the vaso-motor sympathetic? What the histological condition of the centres or the nerves themselves may be, is in the present state of our knowledge a matter of conjecture; but this much is probable, that their normal impressibility is so increased that when subjected to various forms of stimulation an explosion of nerve-force takes place which is represented to our senses by certain vaso-motor disturbances in the nasal passages and other portions of the mucous tract dominated by the cervico-occipital sympathetic. The organs which bear the brunt of the attack are the nasal passages, and the exalted condition, erethism of the turbinated corpora cavernosa, is therefore the leading, distinguishing and characteristic feature of the paroxysm, constituting, as it were, the central symptom around which the other phenomena of the paroxysm are grouped, and from which many of them proceed, either as the result of mechanical causes or from reflex action. The discomfort and more serious symptoms of the disease commence with the swelling of this tissue, and are dissipated with the subsidence of the same. Whatever be the exciting cause of the paroxysm, the tendency to secondary erection of this tissue plays an important *rôle* in its mechanism, and, just as in an ordinary coryza, the central symptom, the most prominent condition, is represented by the swelling of the cavernous bodies. Indeed, whatever the other elements of the paroxysm may be, the phenomena referable to the cavernous tissue constitute the mainspring of the machinery by which it is set in motion. As the distinguishing feature of the paroxysm resides in an exalted condition of this tissue, by diminishing or abolishing its reflex excitability we eliminate the leading element in the complex mechanism of the attack. Now, our experience shows that, while all parts of the nasal mucous membrane may be sensitive to reflex-producing impressions, the most sensitive area is located in the lower posterior portions of the nostrils, a zone corresponding to the distribution of the spheno-palatine branches of the superior maxillary nerve as distinguished from the nasal branch of the ophthalmic. The former nerve, derived through the spheno-palatine ganglion, probably contains therefore the vaso-motor fibres which govern the erection of the turbinated tissue, and as the sympathetic filaments which have been traced to the nasal passages are found in greater abundance over this area, we may for practical purposes speak of a *nasal plexus* located in the sensitive area and intimately associated with the evolution of the nasal reflex. The clinical observations of Roe, Sajous, Ingals and others, and our own, show that this is precisely the area of greatest turgescence and excitability during the paroxysms of the disease, and the localization of the "sensitive area" may therefore be looked upon as the key to the mechanism of the attack. Just here, we would like to call attention to a property of erectile tissues which is consonant with the ideas of reflex excitability formulated above, and which may possibly in a measure explain the relation of erection of the nasal cavernous tissue with the vaso-motor manifestations of the sympathetic form of rhinitis. In the human body, wherever erectile tissue is found, it is intimately related to reflex or sympathetic acts; there seems to be connected with it a certain receptivity to reflex-producing impressions, a certain power of reflex excitability dependent upon its structure and functions. It is thus peculiarly a tissue of sympathy in which we may most satisfactorily study the mechanism of purely reflex or sympathetic acts. Now it seems to us, that, as the nasal corpora cavernosa belong to this class of sympathetic tissues, there will be little difficulty in explaining the *rôle* which they play in the paroxysms of an affection which is probably connected with, if not dependent upon, an excitation of the sympathetic nerve-centres, and in more clearly defining the intimate relation which its erection bears to the reflex manifestations of the disease under review.

For practical purposes, then, we may regard the affection as a coryza dependent upon some derangement of the nerve-centres as its essential cause. The latter may be inherited or acquired; in the latter case it may be brought about in a number of different ways. In the first place it may be the result of pathological conditions of the nasal passages themselves, generally associated with repeated and prolonged erection of the cavernous tissue with subsequent abnormal irritation of the nerve-centres. The nasal disease itself may be developed in the first instance from direct or indirect (reflex) irritation, begetting a hyperæsthetic condition of the nasal passages, and eventually disordered activity of the centres. When therefore the former are exposed to undue irritation, either from *ab extra* influences or from internal causes, an explosion of nerve-force takes place in the centres which expresses itself as a paroxysm. We might illustrate this mechanism by referring to the operation of the *aura* in epilepsy, and the excitation of the spinal nervous system produced by abuse or disease of the generative apparatus.

The excessive irritability of the nasal tissues may be brought about, in another class of cases, by an exalted state of the central nervous system, leading eventually to derangement of the vaso-motor centres, or, finally, a hyperæsthetic condition of the latter may be occasioned by other pathological states of the system as a whole, or as the result of reflected irritation from its individual parts. Whatever be the avenue through which the exciting cause operates, two factors seem to be inseparably associated in the production of the paroxysm—a hyperæsthetic condition of the nasal erectile area, and a derangement of the nerve-centres.

In calling special attention to the irritability of the nasal erectile—or contractile—tissue, we do not by any means seek to overlook the vaso-motor manifestations in other portions of the respiratory apparatus, and even in other organs not directly connected with it. On the contrary, the explosion of vaso-motor force expends itself upon other portions of the tract dominated by the cervico-occipital sympathetic. Just as in a cold in the head, we have symptoms referable to the lower respiratory tract, aural apparatus, eye, etc., so in this form of sympathetic coryza we have disturbances in these and other organs of the body. But the symptoms which stand out in conspicuous prominence are those which spring from the erection of the turbinated tissues. That the manifestations included under the head of asthma, cough, congestion of the conjunctiva, etc. etc., may proceed from this source alone, is shown by their immediate dissipation upon removing the source of irritation in the nasal passages by topical applications, instrumental interference, or by the artificial contraction of the swollen tissues. We have been able to illustrate this by the following experiment. In the course of our treatment of one of our cases with the cautery, we noticed that, when the applications were confined to one nostril, the phenomena referable to the corresponding side of the head were completely dissipated, whilst those of the opposite persisted and were only removed upon cauterization of the mucous membrane of that side.

During the paroxysm this tissue, in our experience, is invariably congested and swollen, and exhibits a characteristic irritability entirely out of proportion to that found under ordinary circumstances, that is to say, in simple inflammation of the passages. Indeed, in a large proportion of the class of cases commonly known as "reflex neuroses," this irritability is so exquisite as to render the contact of the blandest applications unbearable to the patient, and this apart from the presence of any of the exciting causes of the paroxysm.

In transferring the point of greatest excitability from the peripheral ends of the nerve-filaments to the centres themselves, we are fully aware of the want of experimental proof in favor of such a view, but we believe that it affords a more comprehensive explanation of the complex phases of the disease than that which is based on the assumption of organic changes in the terminal filaments of the sensitive nerves.

In accordance with the views expressed above, we proposed some time ago to substitute, for the various names given to this affection, the term *coryza vasomotoria periodica*—a proposition to which Dr. Mackenzie objects on the ground that it involves the acceptance of an unproved theory, although he employs one himself which involves the resurrection of a disproved hypothesis. While we do not claim that the theories advanced by American physicians embody the complete and final settlement of the question, we regard them as less objectionable than those heretofore advanced; we believe that, in indicating the line of future research, they bring the problem one step nearer its solution, and that, by viewing it from the standpoint they suggest, we may catch a broader glimpse of its protean aspects, and be in a securer position to relieve the sufferings of our patients than if we follow the narrow pathway along which the pollen theorists ride their hobby to an invariably unsatisfactory and unsuccessful result.

To our views on the subject of "hay fever," Dr. Mackenzie has two objections to offer: (1) that we do not "realize the true nature of hay fever as a periodical disease occurring *only* during the season when hay or certain flowers are in blossom;" and (2) that "our views of the sensitive area are directly opposed by Dr. Hack, who holds that reflex manifestations do not occur until the anterior part of the lower turbinated body has first become turgid." In regard to the first objection we have this to say: first, that we distinctly recognize the paroxysmal or periodical nature of the disease, both in our definition and in our first communication on the subject; secondly, that while it is true that a large proportion of cases suffer only during certain months of the year, our clinical observation teaches us that in a certain number typical paroxysms occur at all seasons of the year, provided the patients are subjected to the conditions which we have outlined above. Dr. Mackenzie apparently reasons from the assumption that the complex etiological relations of the disease have been thoroughly investigated and definitely determined, and seems to disregard the fact that we are yet on the threshold of inquiry in this direction, that we are just beginning to discover in the many phases of this affection things undreamt of before in our philosophy, and that the true conception of the disease can be reached, not from the exclusive study of external causes, not from the hasty generalizations of isolated experience, but from the higher vantage-ground which overlooks the subject in all its bearings, which brings within our range of vision new facts and new discoveries, from which, in fine, we can regard more clearly the subject himself, and his complex relations to the external and internal forces by which he is influenced and surrounded. As an idiosyncrasy stands for something which is inexplicable, and as "nothing explains why some persons should be affected by pollen and not others," a correct and adequate definition of this affection from the standpoint of Dr. Mackenzie is a logical impossibility. If we have no clear conception of the essence of a thing, it is obviously impossible to define it, and it is therefore highly unscientific to measure the value of independent observation by the criteria of an arbitrary definition.

To Dr. Mackenzie's second objection we would reply that our observations upon this subject have received the independent support of competent observers both in this country and abroad, and that Prof. Hack, in his more recent pamphlets, which doubtless had not reached Dr. Mackenzie at the time his essay went to press, has retreated from the exclusive views which he held in his original publication. It is interesting to remark just here, that, while Dr. Mackenzie unhesitatingly approves the result of Prof. Hack's investigations in this direction, he nevertheless, a few pages further on, makes the most deprecatory insinuation concerning the work of his German *confrère*, who has done so much to throw new light upon this field of nasal pathology. The objection which he urges to the contention of Drs. Daly, Roe, and Allen, that "so few of the many sufferers from nasal disease are affected by the pollen of plants," assuming that the disease is caused by pollen, would be admissible were it contended that the affection is a simple nasal inflammation, and that there is no other factor at work in the mechanism of the paroxysm; but it obviously does not apply to the views outlined above. Applied to the pollen theory, it would carry that interesting conception to a depth from which there could be no resurrection.

Whichever theory be correct, when we come to consider the subject in the light of practical results, we find that the pollen theory offers no hope in the direction of cure; the measures based upon it are simply palliative, and in some respects ludicrous in the extreme; while, on the other hand, the views formulated above offer a prospect of relief in every case and permanent cure in a fair proportion. The cure of the disorder by remedies addressed to the nervous system, to the nasal passages, or both, amounts to the most convincing demonstration, and is a complete and practical answer to the pollen assumption. Dr. Mackenzie's deprecatory remarks on the treatment advocated by American physicians can have very little weight, as he acknowledges that he has but imperfectly studied the question from their standpoint, and has had no practical experience with the improved methods they suggest; but it is a significant fact that the only Englishman who has adopted the American plan, Mr. Lennox Browne, has obtained from it most satisfactory results. If the dissipation of the disease by a given method does not offer "a sufficiently favorable prospect" to justify its adoption, what better criterion of its efficacy, it may be asked, would Dr. Mackenzie require in judging of the merits of the operation? There is, perhaps, no more striking commentary on the inadequacy of the pollen speculation than the Cimmerian darkness it has thrown around the treatment of the disease, and we are therefore not surprised when Dr. Mackenzie informs us that the treatment is "unsatisfactory," and that "prevention is better than cure." But let us turn our eyes for a moment from the horrors of the American method to the pleasant prospect of relief afforded by the pollen theorists, and reflected in the pages of Dr. Mackenzie's essay.

If a life on the ocean wave or a home on the rolling deep be impracticable, "dwellers in towns should avoid the country" and those who reside in the country should proceed at once to "the centre of a large town," or, if this be out of the question, "the patient should remain, if possible, within doors during the whole of the hay-fever season." Active exercise should be carefully avoided, and if the sufferer ventures out of doors, "he should, if possible, avoid the middle of the day," or, if obliged to sally forth at that inauspicious hour, "should protect his eyes by wearing spectacles with large frames accurately adapted to the circumference of the orbits; or he may find some advantage in wearing a hat with a very broad brim." As rapid motion in the open air aggravates the complaint, "it may be advantageous to wear a veil over the face whilst driving or riding. One made of 'three ply' of fine silk gauze has been recommended," but Dr. Mackenzie finds a "double gossamer," which can be had in several colors, answer the purpose in some cases. "Plugging the lachrymal ducts with glass rods," "*closing* the nostrils with a metal clip," and wearing an apparatus containing carbolic acid and camphor within the nostrils, are also suggested to secure comfort to the sufferer. "Protected in this way," says Dr. Mackenzie, "many people disposed to hay fever escape altogether, whilst others contract the disease in a very mild form." To his everlasting credit be it said, however, that he "cannot recommend" the glass rods and metal clip, but he nevertheless adds, "the nostrils may be *plugged* (italics Dr. Mackenzie's) with cotton-wool or wadding by means of one of Gottstein's screws." Apart from many other inconveniences attendant upon such a line of treatment, imagine the tortures of confinement to a closed chamber during the intense heat of our summer months; fancy the spectacle which the victim presents with his eyeballs covered with an unsightly apparatus, his lachrymal ducts filled with glass rods, and his nostrils plugged with cotton—a form of *secundum artem* torture which recalls the ingenuity of Torquemada. But if this should not suffice, consistence with the pollen idea may demand that other avenues be also closed, that the intra- and extra-aural pressure be equalized by tamponing the auditory meatus, and that, in order to avoid the inevitable access of pollen to the respiratory structures which must follow the necessary patency of the mouth, that avenue should be also peremptorily sealed. The experiments of Blackley show that pollen grains may be retained in the clothing for many weeks, and that when let loose upon a mucous membrane they are capable of producing unlimited havoc, and the suggestion naturally arises, why not apply the glass-rod method to the urethra, and the respirator and tampon to the rectum? It has also been proved (to the satisfaction of the pollen theorists) that the disease may commence as an irritation of the skin by the ubiquitous pollen, and it is even possible, if we follow out Mr. Wilson's idea, that the pollen granule may enter the cutaneous capillaries. But, thanks to chemistry, we have an effectual barrier to such intrusion in shellac. As the pollen granule is one-tenth the size of the blood-corpuscle, it is readily conceivable that the means suggested above may prove ineffectual, and we therefore see no escape from inclosing the patient in some form of apparatus like the diving-bell, to which the air may be conducted from the nearest mountain top. But some captious critic may inquire, "With the *primæ viæ* thus hermetically sealed, how is the patient to breathe under the conditions you suggest?" This conundrum has been solved by a surgical friend of ours, who proposes that, as the lower respiratory tract is probably least sensitive to the action of pollen, the operation of tracheotomy be performed—a proposition which we cheerfully commend to those who follow the treatment of Mr. Blackley.

Let, then, the patient, prepared according to the directions given above, don his broad-brimmed hat, fold about him the three-ply gauze, or double gossamer of the rainbow hue, and hie him to the centre of the nearest town where the passer-by may recognize the embodiment of the victory which science has won over disease—"*monumentum aere perennius*."

In the light of recent discovery, and in accordance with our views in regard to the pathology of the disease and the mechanism of its paroxysms, we believe that the general principles governing its treatment may be briefly defined as follows: It should be remembered, at the outset, that the vaso-motor manifestations, of which the erection of the turbinated corpora cavernosa is the central and most conspicuous, are secondary phenomena dependent upon a direct impression made upon the nasal mucous membrane, or on indirect influence conveyed or reflected through the vaso-motor centres from a distant organ; or, finally, from some excitation starting in the centres themselves. Any treatment, therefore, addressed to the nasal chambers, except in the case of the destruction of the cavernous tissue, accomplishes thus one result, and one only—it closes one door against *ab extra* irritation of the nerve-centres. In order to exclude completely the influence of the latter, careful search should be made for any pathological condition, systemic or local, which may be regarded as a source of direct or indirect irritation, and appropriate treatment adopted. Recognizing the prime importance of the reflex excitability of the nerve-centres and the resulting vaso-motor manifestations, an endeavor should be made so to alter the nutrition of the central nervous system that the centres may not respond so easily to the reflex-producing impression. Failing in the above methods, the partial, or if necessary complete, destruction of the cavernous tissue corresponding to the sensitive area should be undertaken. In the majority of cases it is neither necessary nor desirable to destroy large areas of tissue, the amount to be sacrificed depending upon the exigencies of the particular case.

The treatment of the disease by cauterization, which has been carried out so successfully in this country and Germany, has been criticized in England and France, but it is a noteworthy fact that the criticisms have emanated from those who have had no personal experience with the method. A recent French writer of this class has gone so far as to characterize it as an "audacious" procedure. But it should be remembered that it was a Frenchman who referred in similar terms to the first operation of McDowell, and a representative Englishman who cried *Credat Judæus Apella* at the mention of a procedure which has done so much to render the modern surgery of Great Britain illustrious.

In that highly instructive and philosophical production, Gil Blas, occurs the following passage, whose application we leave to those of our transatlantic friends who positively refuse to make trial of the American methods:—

> "'Sir (said I, one evening to Dr. Sangrado), I take Heaven to witness that I follow your method with the utmost exactness; yet, every one of my patients leaves me in the lurch. It looks as if they took a pleasure in dying, merely to bring our practice into discredit. This very day I met two of them going to their long home.' 'Why, truly, child,' answered he, 'I have reason to make pretty much the same observation; I have not often the satisfaction of curing those who fall into my hands; and if I was not so sure as I am of the principles upon which I proceed, I should think my principles were pernicious in almost all the cases that come under my care.' 'If you will take my advice, sir,' said I, 'we will change our method and give chemical preparations to our patients, through curiosity; the worst that can happen will only be that they produce the same effect that follows our bleedings and warm water.' 'I would willingly make the experiment,' he replied, 'provided it would have no bad consequence; but I have published a book in which I have extolled the use of frequent bleeding and aqueous draughts; and wouldst thou have me go and deny my own work?' 'Oh, you are certainly in the right!' said I; 'you must not give your enemies such a triumph over you; they would say you are at best disabused, and therefore ruin your reputation; perish rather the nobility, clergy, and people, and let us continue in our old path.' . . . . 'We went to work, therefore, afresh, and proceeded in such a manner, that, in less than six weeks, we made more widows and orphans than the Siege of Troy.'"

We are sorry that we are compelled to speak thus disparagingly of the views advocated in the brochure of Dr. Mackenzie, but we cannot allow our admiration of the author's ability to interfere with our duty as reviewer. His work is written in his well-known agreeable style, and he has put the pollen theory in as an attractive light as is possible under the circumstances. Championing a feeble cause, his defence is naturally weak, and if he has not thrown new light upon the subject, it is because he is trammelled by the contradictions and many inexplicable questions inseparably associated with the hypothesis into which he has endeavored to breathe new life. He views his subject from the standpoint of Blackley, and has not sufficiently investigated it in the light of recent revelations. We believe that our distinguished author would better employ his powers in exposing its fallacies than in apologizing for a theory which represents not progress, but retrogression.

The pollen idea is better adapted to please the imagination than to persuade the reason. Like the fabled Icarus, in attempting to go beyond its legitimate sphere, it has failed in the accomplishment of its object. Criticism is necessary to knowledge, and erroneous doctrine may in this way lead to more perfect understanding, and in this sense the pollen theory may be said to have accomplished a useful purpose; but, on the other hand, by diverting the mind from more essential etiological conditions, by introducing an insuperable element of confusion into the investigation of the disease, it has contributed in a large measure to retard the progress of therapeutic inquiry. Deliverance from false conceptions based on traditional belief is a task difficult of accomplishment. May we not hope for the co-operation of Dr. Mackenzie in this direction?

Let us, finally, commend to the future historian of this affection the exile of the terms "hay fever" and "idiosyncrasy;" let us hope that the time is not far distant when the pollen theory shall be relegated to its proper historical place as an interesting speculation; that the next essay which treats of it will bear as its motto the eloquent *in memoriam*, or the terse and homely *hic jacet.* May we not even indulge the belief that the next edition of the work before us will be devoted, not to the resurrection of a defunct hypothesis, but to the elaboration of its epitaph?

J. N. M.

ART. XXXI.—*Pulsating Proptosis and Elastic Tumor of Left Orbit consequent upon a Trauma of the Skull—Ligation of Left Common Carotid.* By ROBERT SATTLER, M.D., Ophthalmic Surgeon to the Cincinnati Hospital. Pamphlet, 12mo. pp. 24. New York, 1885.

In this *brochure*, which is a reprint from the *N. Y. Medical Record* of June 13 and 20, 1885, Dr. Sattler reports a most interesting case of pulsating proptosis, and gives the results of an analysis of all the cases reported up to the present time with especial regard to their pathology, symptoms, and treatment. As this affection is frequently the result of trauma of a part singularly exposed to traumatic influences, it may not be uninteresting to give a *résumé* of Dr. Sattler's extended studies upon this subject, with a view to formulating some ideas in reference to treatment.

The earlier cases were described under a great variety of names by various reporters, these names designating either a theoretic pathological condition, or the clinical features of the disease. Among these names we find some eminently descriptive of the affection, but too cumbersome for general use; such as "rupture of an aneurismal dilatation into the cavernous sinus," and "rupture of the internal carotid and anterio-venous communication within the cavernous sinus." Other designations are: aneurism by anastomosis, aneurism of the ophthalmic artery, erectile tumor of the orbit, vascular protrusion of the globe, pulsating tumor of the orbit, and pulsating exophthalmus. In this connection, however, it will be seen that it is impossible to bestow upon the clinical features of these cases one name based upon that usually most satisfactory and most scientific classification—the pathological condition; for, as we pursue our studies, we will find that not one alone, but several lesions are capable of producing similar or nearly identical symptoms.

The literature of the subject refers to 113 cases exclusive of the case reported, making a total of 114 cases up to the present time. Of these 26 proved fatal, or, perhaps it were better to say, died under observation, as an intercurrent disease was the cause of death in many cases. Post-mortem examinations were held in 19 cases, but the reports of some of the autopsies are not so satisfactory as might be wished. We find recorded that "unmistakable rupture of the internal carotid and communication with the cavernous sinus was discovered in four cases, all traumatic."

In five additional cases anterio-venous communication was most probable. Only three unquestionable cases of aneurism of the ophthalmic artery are found in the post-mortem records.

A tumor of the orbit was found in three cases, and Dr. Sattler adds one to "the large list of so-called 'pulsating cancer of the orbit,' cited by Noyes, by a case of his own, verified by microscopic examination and a subsequent autopsy." Three cases of spontaneous rupture of an aneurismal dilatation of the internal carotid into the cavernous sinus are described. One case is reported and described as a "thrombosis of the cavernous and petrosal sinuses" by Bowman-Hulke.

Thus it will be seen that in more than fifty per cent. (12 out of 19) of the cases, the established or most highly probable lesion was "rupture, large or small, traumatic or spontaneous, of the internal carotid, communication with and arterial propulsion into the cavernous sinus and its tributaries."

Aneurism by anastomosis, under which term the first case was described by Travers in 1809, has never been confirmed by post-mortem examination.

The pathology of the affection is the same as that of aneurismal varix or varicose aneurism situated in any other part of the body. According to the extent of the communication between the artery and vein there will be impediment to, arrest or even a reversal of the venous current; and the "back-track evils" resulting from an interference with the venous flow will be more or less pronounced. This may vary from a mere venous plethora to the formation of masses of dilated, tortuous, pulsating vessels in the region drained by the cavernous sinus. The dilatation of vessels and the formation of clots, with the constant deposit of fresh laminæ, lead to pressure symptoms on the nerves traversing the walls of the sinus—the third, the fourth, the sixth, and the ophthalmic division of the fifth. Then come disturbances to the intraocular circulation. The symptoms in a case of this kind are such as might be inferred from a knowledge of the pathology. They are: A wound-like elevation of the palpebral, temporal, nasal, and frontal regions, with an increased thickness of the lids, and an injection and tortuosity of the cutaneous, subcutaneous, and conjunctival veins, chemosis, congestion of the choroid and œdema of the retina; "bossy protuberances," often pulsating visibly and most frequently situated at the upper and inner portion of the orbital opening between the globe and the bony margin of the orbit; proptosis or displacement and pulsation of the globe; a feeling of fulness or pain, disturbances of vision in consequence of ptosis, paralysis of the extrinsic muscles, or disturbance of the choroidal and retinal circulation. Sometimes the pressure symptoms in relation to the nerves are very marked, producing sluggish pupillary movements, myosis, mydriasis, and paresis or paralysis of the motor and sensory nerves of the eye. A marked feature of almost (?) invariable occurrence has been the distressing intracranial noises heard by the patient. These are variously likened to whistling, puffing, the noise of steam escaping from an exhaust pipe, the rattling of a wagon load of iron, purring, cooing, etc.

In concluding his article Dr. Sattler gives an interesting and graphic account of his own case. The symptoms coincide with the classical descriptions given of the affection in those cases which were verified by post-mortem examination. In the treatment conservative measures were first adopted. A very probable case of aneurism of the ophthalmic artery, under the care of Dr. E. Williams, having been successfully treated by means of instrumental compression, the use of arterial sedatives and compression, digital and instrumental, was first resorted to, but without any perceptible modification of the symptoms. The patient was kept in bed and veratrum viride, aconite, and digitalis were administered in increasing doses. Digital compression kept up for fourteen hours by relays of students, and subsequently instrumental compression continued for eight hours were tried without avail. More radical measures were then appealed to and ligation of the left common carotid performed. The results of ligation had been peculiarly happy, and in this case promised well as a prospect of relief if not of cure. "Five weeks after the operation the patient was discharged. At this time the following points were noted: Almost complete reduction of the proptosis. Inability to produce pulsation of the globe. Marked improvement in sight, V = 0.9, with — .75 Oph. Diminution of the distressing noises and absence of the feeling of distension and discomfort about the orbit."

About four months later the patient returned, presenting himself in about the same condition as when discharged. He was willing to submit himself to further treatment if it were deemed advisable. Further surgical interference, however, was advised against.

Cases heretofore reported in which ligation was resorted to have been recorded as fatal cases or as cures with the exception of one, Roux's case, "in which no effect was produced upon the disease." This last case of Dr. Sattler's may be regarded as one in which, though a positive cure was not effected, very marked relief was afforded.

The future history of this case would be of interest to note as regards the maintenance, advance, or recession of the disease. It is interesting too to speculate upon the effect of tying the right carotid, or injecting what remained of the pulsating tumors with an irritating solution, or of attempting galvano-puncture.

Enough is now known, however, of the effects of compression and ligation for it to be laid down as a rule almost invariable in its application that resort should be had in the first place to the first of these, and, this failing after a fair trial to relieve or alleviate the symptoms, that ligation of the common carotid should be practised. Ligation of the other carotid, galvano-puncture, etc. must depend upon too many conditions that surround each case to permit us to carry the dictum concerning treatment further than this. C. H. C.

ART. XXXII.—*St. Bartholomew's Hospital Reports.* Edited by W. S. CHURCH, M.D., and JOHN LANGTON, F.R.C.S. Vol. XX. 8vo. pp. xxxi., 35, 382. *With an Appendix including Statistical Tables of the Patients under Treatment in the Wards of the Hospital during* 1883. 8vo. pp. xxxii., 35, 382, 97. London: Smith, Elder & Co., 1884.

THE St. Bartholomew's Hospital Reports for 1884 contains a most interesting array of papers, of which those on medical subjects largely preponderate over those strictly surgical. A feature also of this volume is the reprint of an old copy of the *Orders and Ordinances for the Better Government of the Hospital of Bartholomew the Lesse*, which was printed in 1652, and which furnishes very entertaining and instructive reading.

The volume opens with a paper on *The Amount of Carbonic Acid in London Air*, contributed by Dr. W. T. RUSSELL. Whilst the application of this paper is one strictly local, Dr. Russell gives a short description of the methods of analysis, and appends tables and charts which interest the general reader.

Dr. GEE'S *Miscellanies* are also interesting reading. They comprise short notes on such subjects as · 1. A kind of Eczema: Vaso-paralytic? 2. Nervous disorders affecting a whole family. 3. Respiratory croaking of babies. 4. Extreme and fatal dyspnœa in newly born children (which includes the notes of four cases). 5. Idiopathic dilatation of the large intestine.

Dr. ORMEROD presents a paper on *The Later Stages of Hemiplegia*, for which the notes of twenty cases furnish the material—these cases belonging to a class in which the "original lesion was essentially non-progressive," that is in cases of vascular lesion almost solely. Modifications of the exaggeration of tendon reactions are noted, Dr. Ormerod laying down the rule that "in persistent hemiplegia, (1) there appears, after a certain duration of the disease, exaggeration of tendon reactions on the paralyzed side; (2) that this exaggeration is generally the precursor of permanent rigidity." The exceptions which Dr. Ormerod notes in his cases were as follows: In several cases the exaggeration was considerable and prolonged, and yet there was no rigidity; in three cases the tendon reactions were greater on the sound than on the paralyzed side; athetosis was associated with one of these; in one case exaggeration was found in both legs, which the author regarded as a precursor of actual paralysis or (occasionally) contracture of both legs.

The second group of cases includes several in which the hemiplegia was associated with some disturbance of micturition. In one of these cases both patellar tendon reactions were almost absent, and the incontinence was regarded as an early symptom of tabes. One instance of muscular atrophy and several of disorders of movement, ranging from rhythmical tremors to irregular jerky movements, are added. In two cases in this group the spasm "was not constant, but seemed to merge from time to time into a condition resembling late rigidity." The last group comprises eight cases of post-hemiplegic epilepsy. In these cases there is also a wide range, varying from epilepsy to *petit mal*.

The paper is one of great interest, and well worth careful study, as it embraces a discussion of minute examinations which are ordinarily overlooked in practice.

Dr. DUCKWORTH contributes a *Note respecting two Old Specimens of Gouty Arthritis in the Hospital Museum*, and an interesting report of a *Case of Acute Pemphigus in an Adult, fatal on the ninth day*, one-sixth of the whole surface of the body being involved in bullous eruption.

Dr. MOORE discusses the *History of the First Treatise on Rickets*, and gives the priority to Whistler, whose treatise was published first in Leyden in 1645, and afterwards in London in 1684. A photogravure of both title-pages is appended to the paper, and the treatise is described and analyzed at some length.

Dr. VINCENT HARRIS and Dr. DARBYSHIRE contribute short papers entitled respectively *Observations on Anæmia*, and *A Case in which Milk was the Vehicle of the Infection of Scarlet Fever*.

In Mr. SHORE'S paper on *Pericardial Effusion* full notes of three cases are included, and as a conclusion the author advises that exploratory puncture should be regarded as justifiable for purposes of diagnosis "when the physical signs are such as to render the presence of dilated heart improbable, and when the suspected effusion is obviously endangering the life of the patient." In the first case which Mr. Shore records, the diagnosis lay between (1) pericardial effusion; (2) dilated heart; (3) some mediastinal growth, including abscess, lying partially in front of the heart; (4) a localized pleural effusion. By exclusion the diagnosis of pericardial effusion was made, and the puncture confirmed it, but the case, which was a desperate one, terminated fatally during the operation.

Dr. WEST presents *A Few Clinical Observations upon the Action of Pilocarpin.*

Mr. BULLER'S *Inquiry into Some of the Conditions of Abdominal Obstruction, leading to the Conclusion that Rupture of the Intestinal wall tends to take place in one place and in a certain manner*, contains an account of experiments made with large intestines from the post-mortem tables. Twenty-four observations were made, the results of which are contained in tabulated descriptions, and an excellent engraving of a portion of the large intestine, showing a rupture of a longitudinal band, is appended to the paper.

Dr. SHAW presents a paper on *Degradation of Type in the Insane;* and Dr. DAVIES adds to the slowly increasing literature of the subject the report of *A Case of Endemic Hæmaturia from the Cape of Good Hope.*

Dr. KIDD contributes the notes of a case of *Fecal Vomiting without Mechanical Obstruction of the Intestines.* The fecal character of the vomiting is attributed to an "œdematous infiltration of the ileum and the greater part of the jejunum, resulting in a paralytic stagnation of their contents—the peristaltic contractions of the duodenum and upper part of the jejunum ultimately leading to regurgitation into the stomach, there being less resistance in this than in the onward direction."

Dr. LAUDER BRUNTON and Dr. CASH furnish a note from the physiological laboratory, *Why do Medicines sometimes fail to Act?* illustrated by several tables and wood-cuts.

Mr. TOOTH'S paper, *A Case of Epilepsy, with Remarks*, calls attention to several points which were unusual in the case which he reports. One of these was the presence of involuntary micturition during a paroxysm, and the absence of tongue-biting. The former symptom the author regards as essentially an epileptic phenomenon as the latter, though less common, and adds that it is sometimes present when tongue-biting is not. He proposes this as an addition to our means for differential diagnosis in cases where it is difficult to distinguish epileptic from hysterical attacks.

An elaborate paper, *Studies of Microbes at the Biological Laboratory of the Health Exhibition* by THOMAS MOORE, and short contributions by Messrs. COMBES and CHRISTOPHERSON on *Transposition of the Aortic Arch*, and a long and interesting history of the *Hospital Pharmacopœia* by Dr. CHURCH, conclude the papers in this volume, which certainly has the merit of presenting a great variety of subjects to its readers.

A word of commendation of the Statistical Tables for 1883 must be added—they are excellent. R. P. R.

The first surgical paper of this volume is by Mr. JAS. BERRY, *On the Treatment of Cancerous Stricture of the Œsophagus by means of Railway Catheters and Soft India-rubber Tubes*, and is a most valuable contribution. As the measures of treatment he suggests, if they prove equally successful upon further trial, bid fair to do away with gastrostomy except in extreme cases, we shall devote considerable space to the consideration of this paper. The degree of originality in the measures suggested is difficult to determine, and is indeed hardly raised by the author. The germ of the idea was contained in Krishaber's paper, in which he advocated the constant retention of a catheter in the œsophagus, and suggested the possibility that a certain degree of dilatation having been thus effected, ultimately a soft, flexible, rubber tube might be substituted. To Mr. Berry is due the credit of having demonstrated this possibility to be a fact, and simplified and rendered easy of accomplishment this apparently most difficult task. Owing to the corrosion which the catheters underwent, Mr. Croft—a firm advocate of dilatation—advised their change every fourth or fifth day. Mr. Berry points out that, owing to their rigidity, the gum-elastic catheter often gives rise to so much discomfort during the patient's movements as to necessitate its removal and a resort to gastrostomy; in addition, later on, the time will come when an instrument can no longer be passed; and, finally, the risk of perforation is not a theoretical one. To do away with these disadvantages formerly inherent to œsophageal catheterism the author advises "railroad catheters," *i. e.*, those with terminal openings which are introduced over a catgut guide, and when withdrawn the same guide is first introduced through the tube, which is then withdrawn, leaving the guide *in situ*, so that the introduction of the same or a larger instrument is readily accomplished, and the stricture is never without some dilating agent. As soon as a certain degree of patency is effected by the catheters, a soft, flexible tube, cut obliquely at its end, is introduced over the guide and allowed to remain for many days, until by its loose movements when drawn up and down it is clear that a larger one can be introduced. In the method of introducing the soft tubes we must refer our readers to the paper, since to make it clear would require a long explanation. The histories of three cases are fully given, most clearly demonstrating the advantages of the method.

The advantages claimed are, that food can be earlier administered in extreme cases than by gastrostomy, since it will pass by the side of the smallest instrument tied in, when none would before; the difficulty in getting through a cancerous stricture is not its calibre, but the irregularities, fissures, and pouchings which entangle the point of the instruments. Now these difficulties can be just as readily overcome by a small as a large instrument, and "whatever the size of the instrument that is first introduced, we may be sure of being able to replace it in a very short time" . . . . "by one large enough at any rate to allow of the introduction of food." The method, therefore, is especially applicable to strictures of narrow calibre in those who are otherwise condemned either to starvation or gastrostomy.

Strictures of moderate size can often be treated "by the periodical passage of a good-sized catheter;" but, if there is much difficulty in swallowing, which would tend to increase the sacculation of the gullet, food should be taken through the catheter. With a tighter stricture, or one where there exists great difficulty in passing an instrument, a temporary resort to continued dilatation, to be followed by periodical catheterism, is advised. Mr. Berry thinks that there are few if any cases in which perseverance will not enable the surgeon to pass a catgut bougie. "When any difficulty occurs in getting the point of the bougie to pass in the desired direction, I have sometimes succeeded in overcoming it by making the patient attempt to swallow a few drops of water, and by gently pushing the bougie onwards just as the water is being swallowed." In the same way, passing the instrument a short distance during each one of repeated attempts at swallowing, will sometimes enable the operator to hit the opening in the stricture, when the œsophagus is much pouched. In the three cases reported the obstruction was high up in the œsophagus. Whether this method is equally applicable to carcinomatous strictures at the cardiac end of the œsophagus remains to be proved.

The Result in a Hundred Cases of Osteotomy, with remarks by ALFRED WILLETT, forms a most instructive paper, which is replete with points of interest, but which is hardly capable of much further condensation, so that we shall refer to but a few of the more striking statements. Although by far the greater number of cases have been operated upon by McEwen's supracondyloid plan, latterly Mr. Willett has resorted to Reeve's modification of Ogston's, or the intercondyloid method, and says that he must express the decided opinion he has formed, that in the more extreme cases McEwen's plan fails to produce a straight limb. He says that McEwen's operation "in his hands has proved a safe, simple, and certain operation in all ordinary cases of genu valgum or genu varum. That casualties have happened, and some of them even fatal, I am of course aware; but the only events among my own to narrate are, that in Case 17, a very tiny splinter of bone necrosed and came away," . . . . "and in Case 4, a considerable-sized piece of the chisel broke off and was left in the bone—a matter apparently of no moment," as "the after-progress gave no indication of anything unusual having occurred." Full Listerian precautions are invariably resorted to since Mr. Willett experienced deep suppuration in two cases after Adams's operation, death resulting in one. In Gants's, as well as in Adams's operation, the author resorts from preference to the saw by means of which he can make more sure of making section in the proper line. The limb should be put up in an *abducted* position to cause *lowering* of the pelvis upon that side, thus concealing some of the *real* shortening. In operating for curved tibia when dividing the bone in the lower fourth—the usual point—the bone is cut obliquely and the fragments are slipped past one another, this manœuvre, according to Mr. Willett, doing away with any risk of non-union, a possibility which, he says, must not be overlooked when operating upon rachitic cases. Many individual cases of great interest are included in the tables, or commented upon in the "Remarks," and the paper concludes with a "note" by Mr. D'Arcy Power, detailing the appearances presented upon dissection of a case which had been operated on for genu valgum nearly eighteen months previously. Any one interested in this subject should read Mr. Willett's paper in full.

Aural Polypi forms the subject of a short paper by A. E. CUMBERBATCH, wherein he shows that they are—as is well known to those conversant with aural practice—more amenable to proper treatment than the general practitioner is aware of. He shows that their most common origin is from the tympanic cavity; that they arise less frequently in the auditory meatus; and that their most infrequent site is the membrana tympani. His observations teach him that when springing from the mucous membrane of the tympanic cavity they generally arise from its posterior half, whilst those originating in the auditory meatus spring from the postero-superior wall, generally close to the membrana tympani. There is nothing peculiar in his treatment, his preferences being for the removal by forceps or snare of those polypi originating in the tympanic cavity which are large, and touching the spot from which they are removed with a saturated solution of chromic acid, while those projecting but slightly beyond the membrana tympani and those springing from the membrane itself had better be treated only by the chromic acid applications and lotions of boric acid ten grains to the ounce of absolute alcohol, or equal parts of liq. plumbi subacetat. and absolute alcohol. Polypi of the meatus are to be removed and their bases treated as above.

Gastrostomy in Malignant Disease of the Œsophagus, by T. WHITEHEAD REID, Esq., really consists of a more extended history, with the final result, including the post-mortem examination, of a successful case of this operation reported in the *Lancet* for Nov. 3, 1883. The author maintains that "permanent catheterization is applicable to cases seen at a far earlier stage than those now under consideration." Bronchial symptoms contraindicate catheterization, as does, still more certainly, suspected or known ulceration. Beyond this there is nothing in the paper with which our readers are probably not familiar.

A paper entitled *Some Cases of Wounds of the Eye*, by ROBERT J. COLLYERS, contains a number of interesting cases in which conservative treatment was attempted with varying degrees of success or failure, but as this contribution consists only of brief histories of cases, this paper does not admit of a profitable abstract, since no general principles of treatment can be deduced.

The contribution of JAMIESON B. HURRY, M.B., *On Gangrene of Uterine Fibroids followed by Expulsion*, like the preceding paper, chiefly consists of the detailed history of two cases, one of which recovered under the use of very large doses of ergot, while the other, at first doing well, died. In the latter case a small portion of the fibroid was cut off, soon after inflammation followed by gangrene set in, sloughing masses were mechanically removed, and recovery was progressing satisfactorily when at the end of five weeks the patient died of peritonitis and septicæmia.

Mr. W. J. WALSHAM contributes a thoughtful paper called *Notes from the Orthopædic Department, on the Treatment of Lateral Curvature of the Spine.* We cannot do better than give the conclusions at which Mr. Walsham has arrived, premising, however, that we cannot agree with him in his estimate of the plaster-of-Paris jacket, raw-hide supports, etc. No one who has had any experience in the treatment of such cases can doubt that entire dependence on any form of support will result in the evils the writer has called attention to, but still, a plaster-of-Paris jacket properly applied, frequently changed, or sawn so as to be capable of being sprung off and yet be accurately reapplied, *conjoined with* posture-methods and gymnastics, has proven in our hands the best method for the treatment of such cases among the poor. The mistake seems to prevail that a jacket of some kind or other once applied is the end of treatment; with us it is the beginning. Here is not the place to enter into an explanation of what we mean by the "properly applied" plaster jacket, but we may say that it is a modification of Mr. Reeves's plan. The author's conclusions are as follows:—

"1. That all slight cases should be treated by posture and exercises.

"2. That with these some form of bandage or shoulder brace may advantageously be combined.

"3. That the patient should be warned not to trust to either of the last as very efficient means of cure, but only look upon them as useful accessories to the treatment by posture and exercises.

"4. That pronounced cases should at first be treated by posture, exercises, bandages, etc., and only be placed in rigid supports if the former treatment from any cause cannot be thoroughly followed.

"5. That advanced or severe cases in which there is muscular debility may be benefited by posture, exercises, etc., inasmuch as the curves may be prevented from increasing, whilst the general muscular strength is improved. But in such little or no improvement of the curves must be expected.

"6. That pronounced and advanced cases may be prevented from getting worse by plaster-of-Paris or felt cases, and may, under some circumstances, be slightly improved.

"7. That all forms of support have a tendency to produce muscular debility, and lead the patient to rely on them at the expense of the muscles of the back.

"8. That even with the use of supports the patient may under some circumstances get worse."

Upon the whole, with the reservations before given, we entirely concur in the author's conclusions.

Extensive Sarcoma of the Vertebræ, Sacrum, Ilium, and Sternum, by H. Lewis Jones, M.D., is the next paper which we shall notice. All the vertebræ from the fourth dorsal or even higher were effected, besides the sacrum, both ilia, several ribs, and the sternum. The reporter remarks that secondary malignant disease of the vertebræ is usually carcinomatous, while most cases of primary trouble have proven, as his case did, to be sarcoma. Secondary growths seem specially prone to follow scirrhus of the breast. "In women who are or have been suffering from scirrhus of the breast, one should not disregard persistent complaint of pain in the back or legs, especially if there be emaciation as well; and if such symptoms are followed by paraplegia, the diagnosis is almost certain." In one case of Mr. Hawkins, the diseased breast had been removed six years before. The author further says, "The symptoms of cancer of the vertebræ are fairly uniform; first pains in some part of the body, usually in the lower limbs, followed by paraplegia, with pains or painful spasms in the paralyzed limbs." Charcot has described this condition under the name of painful paraplegia, saying that lumbar pains shooting down the legs, nearly constant, although worse at night, and which are subject to exacerbations, and affecting all the nervous ramifications, are the first symptoms. These are followed by a difficulty in walking, which soon amounts to paraplegia, but neither analgesia nor anæsthesia is detectable. According to Charcot, the sphincters are unaffected, but this is certainly not the rule, as, for instance, Mr. Jones's case. The reporter suggests that the site of the disease influences this symptom, and states that in all of Charcot's cases the lumbar spine was involved. Finally, Mr. Jones well says, "It is worth while to bear in mind that there may be, as in the present case, extensive disease of the bodies of many vertebræ, without tumor or prominence of vertebral spines, and angular curvature is as often absent as present." It is interesting to note that a continuous *high* temperature was recorded, which fell to the norm on improvement, to rise again when the pains recurred. This disproves the statement made by some authorities, that rapidly growing sarcomata may be distinguished from phlegmons, etc., by their non-febrile course.

Traumatic Cephalhydrocele forms the subject of a paper by Mr. Thomas Smith, in which he relates two supposed cases of this affection. In one death resulted, and a post-mortem examination revealed a large ragged opening through the bone, and no *certain* communication—although the registrar *thought* there was—with the arachnoid sac, much less with the cavity of one of the ventricles, as maintained by Mr. Lucas and Prof. Conner, and as is probably always the case. The post-mortem details by no means demonstrate to us the fact that this was a case such as Conner and Lucas have described, for the tumor contained serum, was bounded externally by the pericranium, and was limited on its deeper surface by the dura mater, but no communication was *proved post-mortem with any of the serous cavities of the encephalon.* The history of the case is by no means conclusive, since with a bony opening of the size described an impulse would be communicated by the normal movements of the brain or in crying, while no mention is made of increased *tension* in the true sense of the word. The other case recovered, *i. e.*, did not die, but the swelling remained. In both instances Mr. Smith considers that the gap in the skull was far too large to have been produced by the injury, and was chiefly the result of absorption. Mr. Bowlby has suggested to Mr. Smith that this absorption was due "to injury to the growing centre of one of the cranial bones, an explanation that would account for the lesion's being confined to young children." Mr. Smith thinks that this affection may be not so uncommon as is generally taught, but that certain cases of unabsorbed cephalhæmatoma are really cephalhydroceles. He is also opposed to any operative interference, and in this opinion we concur.

A Note on the Cause of Pyrexia in Cases of Simple Fracture, and on the Influence of the Nervous System in the Production of Traumatic Fever by Anthony Bowlby, is only another instance of the fact that surgical theories too often work in a circle, and that sooner or later minds of a certain type will become dissatisfied with prevailing theories, and will revert in preference to older ones, since there can hardly be said to be any *really* new ones. We do not intend analyzing in detail the present paper, but shall give some few points which the author holds to be facts. He does not deny that septic changes induce fever, nor the advantages of keeping wounds aseptic, but does maintain that there are other causes. He relates seventy consecutive cases of simple fracture, 8 children and 62 adults, in which temperature observations were made. Among the adults there were only 3 cases in which the temperature did not exceed 98.6° F. In 30 cases the average was 99.7°; in 20 it rose between 100° and 101°, the average being 100.2°; in 9 it was over 101°, the highest temperature being 103°, and the average 102°. The highest point was reached within the first forty-eight hours in almost all cases; in six only did it occur later. In children, strange to say, the least rise took place, the average being 99.2°. Mr. Bowlby says that this fever is really the fever following shock, the old "fever of reaction," and the tension due to extravasated blood is an additional cause. As a proof of the latter factor, he has seen the temperature rise to 102° after the too tight application of a splint to a deformed limb; this can only act, he thinks, through the nervous system. Pain is another element which the author has proved to be capable of raising the temperature from 2° to 3°. "Nevertheless, all pain does not cause pyrexia, but, on the other hand, when excessive, and more particularly when transmitted from organs in connection with the sympathetic trunk, it produces shock and depression of temperature," *i. e.*, renal and hepatic colic, etc. Other points are made in this paper which we cannot devote further space to discuss. If Mr. Bowlby's views are correct, it will certainly prove a great relief to the surgeon's mind to be able to see, in the fever following an operation or traumatism, no *necessarily* septic absorption. In our own observations, we have not found this constant rise of temperature in all cases of fracture, although we have looked for it. It is therefore premature to express an opinion as to the correctness of Mr. Bowlby's views until other observers have corroborated his observations. They are certainly ingenious, and deserving of careful thought and study.

In Mr. EDGAR W. WILLET'S communication, called *Cases from Mr. Savory's Ward*, three histories are given, the first being that of a case of fracture of the body of the sixth cervical vertebra, in which the patient survived until the eleventh day, and then the immediate cause of death was "pneumonia with pleuritic effusion."

The second case, one of recovery in a depressed cranial fracture where there were no compression symptoms, is not so unusual as to be specially worthy of record, if the *exact site of the depression is given*, since no motor or other disturbance was to be expected, unless due to secondary intracranial inflammation. In addition, the external table was considered to be the only one involved. The depression was at the anterior and lower part of a wound which was situated over the junction of the left parietal and temporal bones. This would certainly escape, according to Charcot and Pitres, Championnière, etc., anything *perhaps* but the speech and facial centres, and from the description, the fracture ought to have been below these points. A case of intussusception twice reduced by the injection of warm milk, it seems to us—in view of other histories, post-mortem and ante-mortem—should read "almost completely" reduced at the first sitting, and completely at the second; recovery took place.

G. B. FERGUSON, M.D., describes and figures a *Mode of Cyst Formation in the Mammary Gland*. He considers that in his section "the exuberant gland tissue is caught, as it were, in the very act of forming cysts." It is rather difficult to render his explanation of the section clear without the cut, and we are not at all certain that many practical pathologists were not familiar with the appearances described, although it is true no writers have specifically described them; but, lest any injustice be done, we shall quote his own words:—

> "Firstly, there is a cellular proliferation whereby an acinus is somewhat closely packed. There often ensues expansion of the acinus, with internal production of papillomatous cellular ingrowths, until the external wall condensing more and more, and the cells gradually restricting themselves to two or three layers on the internal wall (the remaining cells having probably coalesced to form the mucous contents), at last a perfect cyst is formed."

From the abstracts of the surgical papers of this volume which we have given, it will be admitted that while they are all of interest, but few of them seem likely to be of very permanent value. C. B. N.

ART. XXXIII.—*The Student's Guide to Medical Jurisprudence.* By JOHN ABERCROMBIE, M.D., Cantab. M.R.C.P., Lecturer on Forensic Medicine in the Charing Cross Hospital Medical School, etc. 12mo., pp. 387. Philadelphia: P. Blakiston, Son & Co., 1885.

THIS little volume is, we believe, the latest aspirant for professional favor in the domain of forensic medicine, a department that has within the last few years been unusually prolific in works of this character, intended more especially to claim the attention of the medical student to what should be regarded as a most important and indispensable branch of his studies, but which has hitherto been almost universally neglected in this country.

The present work is—if one may use the expression—a condensed epitome of the principles and facts of the great science of medical jurisprudence, including toxicology, all compressed within the limits of a small handy volume. The author, who is known as an excellent teacher and writer, tells us in his preface that "he lays but little claim to originality," but that his work "has been compiled for the use of students, at the suggestion of the publisher." We have looked pretty carefully over the volume, and can bear testimony to the fidelity and accuracy with which the compilation has been made from the various authorities cited. Indeed, it might be regarded as a *concentrated extract* of the works of these more voluminous writers. But the question presents itself: Can a science like forensic medicine possibly be acquired by the student in such a condensed form? To one already familiar with the science such epitomes may serve as valuable reminders on review; but we very much doubt whether they can take the place of the more elaborate treatises, whose minuter details are essential to the beginner, as explaining its fundamental facts and principles.

The chapters on the Signs of Death, Identity, Presumption of Death, Death from Cold, Heat, and Starvation, Death from the various forms of Asphyxia, and Causation of Wounds, Blood-stains, etc., are all admirable *condensations* on these important subjects; but in the last-mentioned one—that on Blood-stains—we have a forcible illustration of the evils of this system, pushed too far; for the author, when alluding to the most important of all the facts connected with blood-stains in a murder case,—namely, their identification as *human* blood-spots by means of the microscope—is forced to dismiss the whole subject with the single remark that "the colored corpuscles of man are larger than those of the domestic animals."

The chapters on Wounds in different parts of the body are fuller than some other portions of the book, and are well presented. The one on Insanity is necessarily very meagre. Those on Abortion, Infanticide, Pregnancy, Legitimacy, and Inheritance may be said to contain the gist of the matters treated of, and all their important facts well brought out, though, in our opinion, in a too highly concentrated form. This is especially true of the section on Rape.

The portion of the book allotted to Toxicology embraces nearly one-third of the volume; this fact shows the high estimate of this branch of the subject held by the author, in which we fully agree with him.

The description of the individual poisons in their toxicological relations is as full and accurate as the limits of the work will allow; but there is an entire omission of the mode of detecting them in the human body after death—which is, of course, the main duty of the toxicologist in criminal cases. The reason for this omission, as given by the author in his preface, is that "he has purposely avoided all mention of the search for them in organic compounds, partly because such knowledge can only be really acquired in the laboratory, and partly because in every-day practice analyses of this nature are invariably conducted by an analyst who has devoted special attention to this particular subject." Again, the reader is directed in various places, under the head of *tests*, "to consult works on chemistry for the necessary information." Query: Might not the whole subject of toxicology have been, with equal propriety, referred to treatises on this subject?

In our review of the work, we may not omit to notice a few inaccuracies which no doubt escaped the author's attention. Among the tests for strong sulphuric acid, its action on mercury and copper is stated to evolve sulphurous acid; but the necessity of applying heat for this reaction is omitted. Oxalic acid is described (pp. 210, 211) as having a *bitter* taste. The fatal dose of tartar emetic for an adult is rather loosely stated (p. 229) to be *two grains*, without mention of the fact (recorded by Taylor) that the individual so affected was in enfeebled health. As is well known, in the great majority of cases, a very much larger dose of this substance is required to destroy life. In describing Reinsch's test for this same poison (p. 230) there is an inaccuracy in the statement that "the deposit on the copper is more sooty than in the case of arsenic." In the mention of the iron-test for prussic acid (p. 294), the *ferrous* sulphate alone is given, along with a little potash and hydrochloric acid; whereas a mixture of the *ferric* and ferrous sulphates is much more successful in producing the characteristic Prussian blue.

Under the head of aconite, the author gives an excellent, though succinct description of the *physiological* tests (indeed the only available ones) employed by Drs. Stevenson and Dupré in the late Lamson case in England.

In conclusion, we can commend this little manual (with the reservations above mentioned) as a well-written and faithful exponent of the branch of science that it has undertaken to expound. J. J. R.

ART. XXXIV.—*Manual of the Antiseptic Treatment of Wounds. For Students and Practitioners.* By W. WATSON CHEYNE, M.B., F.R.C.S., Assistant Surgeon to King's College Hospital, Surgeon to the Paddington Green Children's Hospital, etc., with illustrations. Small 8vo., pp. 151. New York: J. H. Vail & Co., 1885.

MR. CHEYNE, in his preface, points out that in the introductory chapters he has treated of matters which were not ripe for discussion when his work on Antiseptic Surgery was written, so that together they will furnish the reader with as complete a view of the subject as is possible at the present time. We will go a step further, and say that the author has done his work so admirably in the book under review, that few need desire a more satisfactory account of the antiseptic treatment of wounds than is contained in its pages.

It is by no means only a treatise upon the antiseptic method, but in the way of elucidation and illustration of his subject the author has given his readers a most clear and interesting chapter on the repair and dangers of wounds. Within a small compass he has clearly compressed all that is taught upon this subject in the chief surgical text-books. He also quotes and explains Tillmanns's experiments upon the so-called organization of blood-clot. He contends that this process is the same for an open aseptic wound as for subcutaneous clots. In the latter the clot becomes infiltrated with young cells which develop into fibrous tissue, the original blood-clot becoming absorbed and ultimately also much of the newly-formed material. The essential for this absorption is a non-irritating condition of the clot. We have given this special explanation of the so-called organization of blood-clot, for, like the similar organization of the animal ligature, even those who ought to be better informed seem unacquainted with what is meant by the phrase. In reality both clot and ligature act precisely as the sponge-graft does, *i. e.*, as a scaffolding whereby the young infiltrating cells may be built up into masses, and so retained for such a length of time as may suffice for their organization into young connective tissue. In neither case does the blood-clot or ligature take any active part. We have ourselves undoubtedly seen this process taking place in an open aseptic wound.

Chapter II. is devoted to a concise, yet admirable *résumé* of what it is desirable to know concerning "Bacteria and Disease" as far as wounds go. For the information of those of our readers to whom works on bacteriology may not be readily accessible, we shall enter somewhat into detail as regards the facts given by the author. There are four classes of organisms, viz.: micrococci, or round bodies; bacteria, small, oval, rod-shaped bodies, about twice as long as broad; bacilli, rods of various lengths; and spirochaetæ, or spiral filaments. Some are always motionless, some move for a time and then become stationary, when they frequently collect in masses by mutual adhesion, forming zoogl&oelig;a. Motion, as a rule, seems in proportion to the amount of oxygen present. Growth is always by division, although spore-formation may be superadded. Bacilli divide transversely to their long axis, while micrococci may divide longitudinally as well, forming triplets or series of four. Growth is rapid, but its rate is dependent upon the nature of the soil and the degree of temperature and moisture. Spore-formation has only been observed for the bacilli, and seems to occur when their food is nearly exhausted; this process providing for the future existence of these organisms. Spores are endowed with wonderful vitality, which they retain for years, even in the dry state. They are very resistant to chemicals and heat; infinitely more so than the adult forms. Micro-organisms are present in large numbers in dust, in water, and on all objects, while the air, by gravity, etc., although containing some, may be comparatively free; therefore the introduction of any minute material object into a sterilized organic fluid, or into wound-fluids, is certain at the same time to introduce a number of micro-organisms. Different soils suit different organisms. "The substances essential for their nourishment are water, phosphates, salts of potash, carbonaceous and nitrogenous organic substances." A neutral or slightly alkaline reaction of the medium is best for most bacteria, though not for all. The majority require, or grow best, in free oxygen, although for some species it must be almost if not entirely absent. Extensive alterations result in the materials in which they grow, *i. e.*, they break up the complex organic substances, reducing them to simpler forms, and some of their products resemble, in their effects, certain of the alkaloids, producing toxic symptoms when introduced into the animal circulation.

There are two classes of organisms producing "infective diseases," only one of which requires an open wound; with this latter class we are alone at present interested. Those micro-organisms which cause such alterations in the organic fluids as result in the product of a poisonous alkaloid are the cause of what is known as "septic intoxication." The symptoms are not due to multiplication of bacteria, but to the alkaloidal poison, since the destruction of the micro-organisms does not perceptibly diminish the effect of solutions containing this ptomaine. In small doses, or repeated small doses, death does not result, *i. e.*, only traumatic fever occurs. Where a large surface for absorption exists, and where large, or frequently repeated small doses are absorbed, or where the patient's excretory organs, as the kidneys in Bright's disease, fail to do their duty, death will often result. A healthy, granulating surface seems a complete barrier to the absorption of this substance, which has been obtained in a crystalline form by Bergmann. The same bacteria cause local inflammation and suppuration, although these results may follow from other irritants, such as strong solutions of antiseptics, etc. Only certain micro-organisms —chiefly micrococci—can grow in the living tissues and cause suppuration, while others multiply in the discharges alone, producing irritating products which set up pus-formation. The causes of suppuration in a wound may then be said to be: 1. Decomposition of the wound discharges. 2. The presence in the wound of various chemical irritants, perhaps certain antiseptics themselves. 3. Tension from retention of discharge, especially when undergoing fermentation. 4. Multiplication of micro-organisms in the surface-tissues of the wound. Some micrococci cause inflammation without previous injury or wound, such as those which produce the spreading abscess of rabbits; while others—as those of osteomyelitis—although present in large quantities, cannot cause the disease unless some traumatism be superadded.

The evidence is accumulating, so that there can be little doubt, that the *acute* spreading gangrene and phagedæna of man are due to the same streptococci, which, when inoculated on mice, always produce this disease. Of course other causes of gangrene exist, but Mr. Cheyne seems to prove that even in senile gangrene the *spread* of the disease is chiefly due to the inflammation set up by the presence of micro-organisms in the discharge, or by tension, which the weakened tissues cannot withstand. If this be true, with aseptic precautions he thinks that we may disregard the old rule about not amputating for senile gangrene. Gangrene after operations on wounds is, according to the author, due to: 1. The direct destruction of tissue, injury of bloodvessels, etc. 2. To inflammation of feeble tissues, when it results from the growth of micro-organisms in the tissues or discharges, or there is simple tension. 3. To the effects of multiplication of certain bacteria in the tissues, as in the spreading gangrene of mice. Erysipelas has been produced by one observer alone (Fehleisen) in seven cases by the inoculation of the pure micrococci of this disease.

Pyæmia—certainly in rabbits, probably in man—has been proved to be due to the growth of micrococci in the blood, where they aggregate, and, either locally or by a process of embolism, cause the disseminated abscesses of this disease.

> "Septicæmia is a much more complicated affection, and probably arises under several circumstances. Continued absorption of the poisonous material from wounds referred to under the head of septic intoxication will keep up a feverish state, with all the symptoms of septicæmia, and if long continued may terminate fatally. In other cases the micrococci grow in the tissues of the wound, and pour their products or ptomaines, as they are called, into the blood. Here micrococci may be found in the blood, but the essential seat of the disease is the tissues. In a third form micrococci grow in the blood, and multiplying there give rise to the symptoms. In a fourth form organisms grow in the blood, but they belong to the class of bacilli. The last two cases correspond to what is found in the lower animals (mice, rabbits, etc.). In them septicæmia is caused by more than one organism growing in the blood, and giving rise to symptoms and post-mortem appearances which can only be classed together as septicæmia."

Chapter III. is devoted to the consideration of the "Destruction of Bacteria," and there are certain points which it behooves us carefully to consider. Mr. Cheyne shows that the earlier experiments are unreliable, and none but those conducted as Koch has done should be considered as decisive, owing to the resisting power of spores and the different viabilities of the various micro-organisms. From Koch's experiments it was shown that the spores of bacillus anthracis required immersion in a 5 per cent. solution of carbolic acid for twenty-four hours to destroy them, and even then one or two grew; while the adult bacilli were killed by immersion for *two minutes* in a *one* per cent. solution of the same antiseptic. In addition an amount of an antiseptic which will not *destroy* a micro-organism may hinder its *development;* in many cases this practically amounts to the same thing. Thus, $\frac{1}{850}$ to $\frac{1}{1250}$ part of carbolic acid prevented the growth of bacillus anthracis in meat infusion containing peptone. The action of the vapor of this acid at the ordinary temperature for forty-five days did not destroy the spores of earth bacilli, while the same exposed at a temperature of 55° C. for an hour and a half only developed a few colonies; at 75° C. for two to three hours all growth was completely arrested. The menstruum is important; thus 5 per cent. carbolic acid (the fatal dose when in water) in oil did not affect the spores of bacillus anthracis after 110 days. The bearings of these facts are too manifest to need dilating upon, while further illustrations would be superfluous. The author hazards the suggestion that the differences between the practical and experimental results found in the use of carbolized oil are probably owing to the fact that the fluids of the wound abstract the acid from the oil, and thus the antiseptic acts in a watery solution.

Interesting and instructive details are given as to the power of the various disinfectants in killing the spores of bacillus anthracis. There is evidently an error as to boracic acid, which is said to kill them in 5 per cent. solution within 24 hours in one place, and in another a saturated solution is stated to only delay vegetation after six days. A few more facts as to the destruction of micro-organisms, and we have done. As Koch's experiments were performed on pure cultures without extraneous substances it does not follow for instance that in *practice* similar results will be obtained. Thus $\frac{1}{1000}$ part of mercuric bichloride will not destroy the tubercle bacillus in *sputum* even after 24 hours' action, while a 5 per cent. watery solution of carbolic acid will effect this result in the same time; yet on dry spores the result is reversed. Many other interesting points will be found on reference to the full text.

Next follow several chapters on aseptic surgery, which is declared to be the "*exclusion* of active ferments from the discharges of wounds," while antiseptic surgery is their destruction after having *gained access* to the wound-fluids. This subject has been so thoroughly gone over in previous reviews in this JOURNAL that only a few points which are new, or from being constantly overlooked need iteration and reiteration, will be touched upon. Thus the addition of either alcohol or glycerine to render carbolic acid more soluble in water, lessens its power, since these substances hold the acid more tenaciously than water.

The failure to render effective capillary drainage by absorbable drains is shown to be due to three errors: the first is that the drain is not secured to the bottom of the wound; the second, that the threads are not brought out in a number of bundles, each of not more than 5–6 threads, but usually in a single bunch; and third, that the individual bundles of catgut are apt to be broken up outside the wound, "for the capillary action occurs in the intervals between the threads when they are closely apposed." Finally, such drains will *not* do for anything but blood or *serous* discharges. Numerous illustrations and descriptions are given of the most effectual methods of retaining the edges of the antiseptic dressings in contact with body surfaces, the neglect of which is a most fruitful source of failure in this method. Speaking of wounds of the abdomen with protrusion of omentum where the latter is very dirty or difficult of return, the author advises resort to Dr. Kenneth McLeod's plan of "stitching the deepest part of the omentum to the deep part of the wound, cutting off the remainder and closing the skin over all."

When adverting to Mr. J. Hutchinson's successful treatment of wounds he shows that Wilhelm Hack has proved that carbolic acid applied directly to *granulations* so modifies their power of preventing absorption that they act almost like recent wounds, thus showing the inadvisability of using this substance except aseptically, *i. e.*, not in direct contact with the wound; and that pure alcohol, applied to granulations for a time, in great part or entirely prevents absorption through them. Mr. Cheyne says, "The favorable results of constant irrigation, especially when antiseptic fluids are employed, in preventing septic diseases are very remarkable, and, in this respect, it probably stands next to strict aseptic treatment." We can fully endorse this statement.

"The method of treatment which has been the greatest stumbling-block in the way of the acceptance of the principles of antiseptic surgery is the open method, for surgeons could not see how the success of this method could be reconciled with the germ-theory of putrefaction." In brief, without demonstrating in detail the truth of the author's propositions (which we did elsewhere years ago), the good results of the open method are due to perfect rest, free drainage, and concentration of the fluids and their admixture with oxygen; the former renders them unfit soil for the growth of bacteria, while by means of the latter those organisms which do grow get their oxygen from the atmosphere, and do not break up organic compounds, thus avoiding the formation of ptomaines. In addition, oxygen, according to Pasteur, is actually destructive to the bacteria of putrefaction. It will be observed in conclusion that we have merely stated the author's views, and have not indulged in much comment thereon. This is simply because we thoroughly agree with the writer upon almost every point, and this after extensive experience with most, if not all, of the methods he describes. It is a most valuable book, and those who do not care to go to the expense of his larger work cannot do better than to purchase this little treatise.

C. B. N.

ART. XXXV.—*Vorträge aus dem gesammtgebeite der Augenheilkunde.* Von Dr. LUDWIG MAUTHNER, k.k., Prof. in Wien. 12te Heft. *Die ursächlichen Momente der Augenmuskellähmungen: die Nuclearlähmung. Wiesbaden*, 1885.

The Causal Conditions of Muscular Paralysis of the Eye: Nuclear Paralysis. By Prof. L. MAUTHNER.

THIS part of Prof. Mauthner's important and comprehensive work on general ophthalmology is of interest, not only to the practising ophthalmologist, who will find in it the fullest consideration of the subject to be found in ophthalmic literature, but also to the physician who has to deal with nervous affections in their various forms and phases, for the whole of the instalment before us is given up to the study of the central causes of muscular paralysis of the eye.

Preceding, however, an investigation of these causes, there is a very short but sufficiently clear exposition of the function of the six external and the two internal muscles of the eye, and of the methods by which a paralysis of each and all may be diagnosticated. These methods are well known to all ophthalmic surgeons, and are to be found in all treatises on the eye. Their further consideration here is therefore unnecessary.

The cranial nerves that supply the eye muscles are the 3d, 4th, and 6th pairs, and it is readily understood that an affection of any one would lead to impairment in the function of the corresponding muscle or muscles. Pressure on the 6th nerve, for example, should cause paralysis of the abducens; on the 4th, the trochlearis; while, if it be on the 3d, all the remaining six muscles together with the elevator of the lid will be affected. Clinically, however, we do not find paralysis distributed in keeping with this arrangement, and it is this fact which lies at the foundation of the brochure before us. As the 4th and 6th nerves supply a single muscle each, their paralysis can affect only their respective muscles; but it is otherwise with the 3d, which supplies four of the external and the two internal (recti sup. inf. and int.; oblique inf.; iris, and muscle of accommodation). We find in practice that any one of these muscles may be affected, the others remaining intact, or that any number short of the whole may be implicated. To explain this phenomenon is the attempt of Prof. Mauthner in his idea of a "nuclear paralysis."

Recently there has been an attempt to divide ophthalmoplegia into two general heads of "external" and "internal." For certain purposes it is a useful classification, but Mauthner very properly suggests that these forms of ophthalmoplegia can be, for etymological reasons, more properly called "interior" and "exterior." A further subdivision is into "perfecta" and "imperfecta;" and also one into "unilateralis" and "bilateralis."

Coming now to study the aspects of muscular paralysis as clinically presented we find: 1. That we may have all the exterior muscles affected, the interior remaining intact. 2. Any one or more of the external muscles may be affected. 3. The interior muscles may be affected alone. 4. Either of the interior muscles may be affected alone. In support of this proposition Mauthner gives often in great detail the clinical histories of cases gathered from the literature on the subject from the time of Gräfe down to the present. These clinical facts can only be accounted for, in the opinion of the author, by the existence of a separate centre for the nerve-fibres going to each muscle. And it is but fair to state that experimentation on the cerebral functions conducted by Hänsen and Völkers and others lends strong support to this view.

There are, however, other forms of paralysis than the nuclear. Excluding the causes operating in the orbit, we have the cerebral and basal: the former embracing those cases having their seat in the brain itself; the latter those to be found operating on the nerve somewhere in its course along the base of the skull. The cerebral forms include: 1, the cortical, in which the cortical gray substance concerned in the movements of the eyes is affected; 2, the nuclear, in which the seat of trouble is that collection of nerve-cells lying in the gray hollow of the 3d ventricle, the aqueductus Sylvii and the 4th ventricle; 3, the fascicular, where the fibres which connect the cortical substance with this collection of cells is impressed. It is the opinion of the author that these cells in the 3d and 4th ventricles are the centres of affection in most cases of central paralysis of the eye-muscles, and the fact that there is isolated paralysis of a single muscle or groups of muscles must be accounted for on the supposition of a separate centre for each. A scheme of arrangement of such centres was proposed by Hansen and Völkers, but to the author's mind it is not so satisfactory, in view of the observed facts, as that of Kahler and Pick. Going from before backward their arrangement is:—

1. Muscle of Accommodation.
2. Sphincter Iridis.
Medial. { 3. Rectus internus.
4. Rectus inferior. }
Lateral. { 5. Levator palp. sup.
6. Rectus superior. }
7. Obliques inferior.
Trochlearis.

The reason for the acceptance of this plan is that it coincides quite accurately with the order in which the muscles are affected in progressive paralysis, in which case it is supposed that the morbific cause affects the centres successively, and clinical evidence is brought in support of the proposition.

The author discards entirely Hutchinson's idea of an involvement of the lenticular ganglion within the orbit as a cause of a paralysis of the interior eye-muscles. In such cases, by no means rare, it is supposed that centres 1 and 2 of Kahler and Pick are affected. Moreover, from a careful study of the clinical histories of the reported cases, the author is convinced that there is no associated nuclear paralysis, as is thought to be the case by some, and that there is no crossing of the fibres to the cell-centres of the opposite side; that, in other words, the nerves for the muscle of each eye have their centres on the same side.

The causes of nuclear affection are various, and may be primary or secondary; among them may be noted ependymitis with secondary affection of the gray arches, restiform or multiple sclerosis, and all those affections which lead to atrophy of ganglion-cells. Unquestionably hemorrhage into the ventricles has produced the paralysis in several reported instances. Syphilis is in some cases a remote cause. Of treatment the author will speak after he has considered the other forms and varieties of eye-muscle paralysis. S. M. B.

ART. XXXVI.—*Operative Surgery in the Calcutta Medical College Hospital: Statistics, Cases, and Comments.* By KENNETH MCLEOD, A.M., M.D., F.R.C.S.E., Fellow of the University of Calcutta; Surgeon-Major Indian Medical Service; Professor of Surgery Calcutta Medical College; and First Surgeon College Hospital. 8vo., pp. 340. London: J. & A. Churchill, 1885.

FROM its very nature, consisting as it does of the abstracted histories of a large number of carefully observed cases, this book cannot fail to be of permanent value. Nevertheless, it does not admit of anything like an analytical review. Being founded upon the after-practice of the same hospital from which Sir Joseph Fayrer drew the chief materials for his well-known works, *Clinical Surgery in India*, and *Clinical and Pathological Observations in India*, Dr. McLeod's work is of special interest, as it affords us an opportunity of contrasting the results of the older methods of treatment with strict Listerism.

As the author points out in his preface, surgical statistics are only too apt to be misleading, as being "the outcome of work by different men under different circumstances and according to different methods." Successes and striking cases are apt to be reported, while failures and commonplace cases are disregarded. Again, the operator may have acquired a special dexterity in the performance of certain operations, or, guided by sad experience, has so carefully selected his cases that others more inexperienced cannot but fall short of his measure of success. Dr. McLeod has accordingly given us the results of all his operations for five years, with sufficient details of each to enable the most careless reader to ascertain for himself the correctness of the author's inferences.

Among the numerous good points of this book, we would call special attention to the marginal notes, which enable the reader at a glance to ascertain the whereabouts of any special fact that he is in search of.

In Chapter II. careful explanations are given of the "conditions affecting the success of surgical treatment in the Medical College Hospital," which clearly prove that an average of mortality which would be appalling in a European city is rightly a matter of complacency in Calcutta. "The insalubrity of the hospital, and especially its surroundings, have been much improved by the changes inaugurated by the efforts of Dr. Fayrer and his colleagues," and Dr. McLeod, with commendable fairness, says that the decreased mortality is sensibly due to to these changes, although improved methods of wound-dressing deserve their share of praise. It is but fair to state that, both during the pre-antiseptic and antiseptic periods, a large proportion of the fatal septic cases have been "admitted with the disease"—erysipelas, septicæmia, or pyæmia—"fully developed." The author shows that the belief that native Indians are remarkably tolerant of severe operations is, like all positive rules, one that requires a most careful statement of the exceptions. The belief is a warrantable one for the "up-country" rustic native, not for the ill-fed, ill-housed, malaria and syphilis-stricken, opium or hemp-consuming inhabitants of Calcutta and its environs.

Chapter III. consists of statistical tables of eight hundred operations, with comments thereon. Each succeeding chapter is devoted to the consideration of some one class or a series of cognate classes of cases. In the fifth chapter, which deals with operations upon arteries, the author, when relating the history of a case of popliteal aneurism, points out the interesting fact that aneurism, other than traumatic, is almost unknown among the native Indians, and that this is not his individual experience, but that of other surgeons. The chapter on injuries, diseases, and excisions of joints contains numerous cases of interest, into the details of which we cannot enter, but there are special general points worthy of comment. Thus, although syphilis is so rife, and often so maltreated in India, the joints commonly escape, together with the osseous and vascular systems. Again, periarthritis, resulting in destructive articular changes, is not uncommon after smallpox. Still more interesting is it to note that strumous disease of joints "is extremely rare among natives." *Brisement forcé* is the favorite treatment for stiff-joints, and, doubtless owing to the absence of strumous tendencies among the natives, seems to be a much more successful practice than with us. Antiseptic incision into suppurating joints is highly extolled, and, judging from the results, with reason.

Two cases of wire-suturing of the patella are reported, one of which was eminently successful, and accompanied by no evil consequences. The other, owing to the supervention of carbolic-acid poisoning, had to be dressed with boracic acid; the joint suppurated, and, although recovery ensued, "a lame, stiff joint" resulted. In both cases the wires were removed, not turned down, their points hammered into the bone, and left, as seems to us the better practice, *provided* any wiring at all be done. We can conceive of circumstances under which we might be induced to wire a broken patella, but they are so peculiar that we question whether they can ever arise.

A long chapter is devoted to amputations, which number 61 with 16 deaths; 38 of these cases were for accident, the remainder were performed for the removal of disease. We shall call special attention to but two cases, viz., one of amputation of the upper extremity for sarcoma, where everything was removed except the inner half of the clavicle; death from shock took place in one hour after the completion of the operation. The second case is certainly one of excessive rarity, and resulted fatally from shock five hours after the completion of the operation. We certainly never remember having read of a similar operation, although such may perhaps be upon record. The removal of an immense soft sarcoma of the left hip of rapid growth was attempted by amputation at the hip-joint, but in order to extirpate the growth, "the whole of the ischium and the greater part of the ilium and pubis" had to be removed by "the chisel, hammer, gouge, and bone-forceps." But little blood is said to have been lost. In both instances the lungs were found involved, so that we agree with Dr. McLeod when he says that in such cases as occur so commonly in Bengal, and of which these seemed to be types, "the propriety of operation is more than doubtful," unless the disease involves parts less important than the scapula or pelvis, and is seen in its earlier stages. This chapter concludes with a comparison of results between the author's series and those of Sir Joseph Fayrer, the two series being separated by a space of ten years. The class of patients, rules of admission, etc., being similar, any improvement must be due—first, to improved sanitation; and, second, to methods of dressing. Sir Joseph Fayrer's mortality was 66.6, while that of Dr. McLeod's was only 31.9. The former series deals with a larger number of cases, and extends over a longer period, so that, together with the improved hygiene, etc., of the hospital during the period included in this work, the facts do not prove that much has been effected by the methods of dressing. We do not doubt that antiseptic dressings had much to do with the improvement recorded, but we cannot see that the fact is proved by the figures, although an examination of the causes of death shows an entire absence of pyæmia, septicæmia, osteomyelitis, etc. On the other hand, "exhaustion" is credited with 20 per cent. of deaths. We have always looked upon this term as a possible cover for either unsuspected or excluded septic troubles. As before said, even a mortality of 31.9 per cent. is appalling to our more favored eyes, but, considering all the circumstances, is rightly a source of congratulation to Dr. McLeod.

The author mentions in his ninth chapter, when speaking of malignant tumors, that he had resorted once to the temporary ligature of the axillary vein when removing a growth, this expedient proving beneficial only, no evil result following. Dr. McLeod removed the larynx twice for epithelioma; once with complete success, although the patient died five months and a half after the operation from pulmonary phthisis, while the second patient perished from venous hemorrhage on the fifth day.

The chapter (tenth) treating of non-malignant tumors is of special interest, since 129 of these were elephantiasis of the scrotum, among which only 23 deaths occurred; a small proportion when the details of the cases are examined. The heaviest tumor weighed 96 pounds, and the operation proved fatal from diarrhœa, vomiting, and exhaustion. All those interested in this subject should read Dr. McLeod's comments on his cases, which contain many practical hints as to operating, and much scientific information. He calls special attention to the fact that the experience in India shows Dr. G. A. Turner's advice to be unwise to save perineal skin when in the slightest degree infiltrated, since recurrence is then certain. Of the two forms of scrotal elephantiasis, the ordinary more or less solid tumor and the "lymph scrotum," only the latter seems to be associated with the presence of filariæ. Syphilis, alleged so often to stand in a causative relation to elephantiasis, especially by Dr. Allan Webb, is thought by Dr. McLeod to be efficient, if at all, by the local irritation of the sore, and more probably still, by blocking of the lymph-current, the result of hyperplasia, inflammation, and destruction of the inguinal lymphatic glands. The reader is referred to the work for directions as to restraining hemorrhage, and dealing with the testes, and for special methods of operating, which seem to us of great value.

Among the cases of benign growths was an "immense outgrowth or aneurism of the axillary vein" which was successfully removed, the wounded vessel being secured by catgut ligatures. A successful removal of a large bronchocele is also detailed.

Owing to the infrequency of stone in Calcutta only 30 cases are recorded; 3 being urethral; 19 vesical, for which lithotomy was performed with 3 deaths; while the remaining 8 were lithotritized, the only fatal result following rapid lithotrity, *i. e.*, Bigelow's litholapaxy. From the number of cases, 64 with 12 deaths, hernia seems to be a very common affection in Calcutta. 45 of the operations with 3 deaths were for the radical cure of the herniæ. Of this number 17 were operated upon by Wood's method with only one death, but a number of failures occurred. From this latter circumstance Dr. McLeod was led to adopt the antiseptic ligature and removal of the sac, with suture of the pillars of the ring with strong catgut. By this method he reports a number of gratifying successes, and gives two plates of the appearances presented by the careful dissection of one of his successful cases that died seven and a half months after the operation. Perineal section seems to be a favorite operation with the author, having been done in 28 cases.

Owing to the special tendency of the natives of Bengal to suppurative inflammation, serious abscesses involving danger to life are common: thus, 129 cases with 14 deaths are recorded. As far as possible they were all treated antiseptically, with results which the author assures us were most gratifying.

A certain number of cases of plastic surgery are reported, but form a small and unimportant percentage of the total. Nerve-stretching was resorted to in 6 cases, with one death from the original disease, *i. e.*, tetanus.

Three cases of anæsthetic leprosy, involving the distribution of the musculo-spinal nerve (one), and the ulnar nerve (two), were treated, with sufficient success to warrant a repetition of the operation, by "nerve-splitting." Neurologists would do well to study the history of these cases, and the comments of the author thereon, as they afford food for profitable rumination.

Death-rates and causes of mortality, hospitalism and antiseptics, with four instructive appendices, complete this interesting volume, which, certainly in its province, is a valuable contribution to surgical science.

C. B. N.

ART. XXXVII.—*A System of Practical Medicine by American Authors.* Edited by WILLIAM PEPPER, M.D., LL.D., assisted by LOUIS STARR, M.D. Volume I, *Pathology and General Diseases.* 8vo., pp. 1091. Philadelphia: Lea Brothers & Co., 1885.

L'appêtit vient en mangeant! Not satisfied with the seventeen volumes of Ziemssen, or with the smaller reprint of Reynolds's System, the profession calls eagerly for more, and kind friends are at hand to gratify their slightest wish.

The relation of publishers to the medical literature of the country is of course intimate, and, in certain respects, curious enough. They watch the market closely, and know well just what wares are in demand, and are careful to see that the supply is equal to the occasion. While no one could wish to detract in the slightest from the great services which the large publishing-houses have rendered to the profession, a review of a list of medical works issued during the past twenty-five years raises a question whether the highest interests have always been served by these publications. The reprints with which the trade has been deluged have acted most detrimentally to the native author who has had to enter into competition in a market stocked to repletion with low-priced foreign works. That the local productions have in so many instances thriven speaks well for their vigor. In another way the medical publishers have hindered the development of medical literature in this country. In scores of instances they have made literary hacks of men, fit to do good and enduring work, by seducing them into editing English works "with additions and corrections," a style of labor above which very few have subsequently been able to rise. That we have entered upon a happier period for the native writer, the publication of this work is a most satisfactory proof. It marks, indeed, an epoch in the history of American medical literature. No such comprehensive work has hitherto been attempted, and for books of the kind we have been entirely dependent upon foreign sources.

In scope and character the work resembles Reynolds's *System of Medicine,* and embraces the entire field of medicine, including the specialties. The classification and nomenclature are those recommended by the Royal College of Physicians of London and the American Medical Association. The editor has been most fortunate in his staff of collaborators, and with but few exceptions the names of the authors of the articles in these volumes are well known to the profession, and recognized authorities on the subjects upon which they have written.

The first section, on *General Morbid Processes*, from the pen of Prof. Fitz, of Harvard, illustrates how thoroughly the German "*geist*" possesses the younger generation of our teachers. Twenty-five years ago, French and English modes of thought and studies ruled, or at any rate prevailed, among us, but since about 1860 scores of men have annually returned to their homes from Europe, having drunk deeply at Teutonic, and but lightly at Gallic and Anglican springs. The effect of this is very apparent in our journal literature, and is peculiarly shown in this article by Dr. Fitz, in which there is but one reference to a French author, and not one to an English work. While in certain respects this almost servile adhesion to German methods and thought has been in the highest degree beneficial, particularly in the various specialities, in others it has acted injuriously, and too many of the younger men have little personal knowledge of, and less sympathy with, English and French medicine. However, in an article on *General Pathology*, if anywhere, we can forgive an author for drawing almost exclusively on German sources, for from the laboratories beyond the Rhine have come the important modern contributions in this department.

The subject of inflammation is treated in a clear and comprehensive manner, and useless discussions on doubtful points are avoided. There seems a lull just at present in the strife over the histological details of the process, but the question of fever is being actively studied. The consideration of thrombosis and embolism leaves nothing to be desired unless it be illustrative figures which would have been useful in explanation of the text. The degenerations receive full measure in twenty-two pages. The subject of tuberculosis is naturally one to which we turn anxiously to ascertain our author's views. A brief but sufficient sketch of the growth of opinions precedes the consideration of the infective nature of the disease. The evidence which shows that the production of tuberculosis is dependent on the presence of bacilli which are to be regarded as the virus is thought satisfactory—a conclusion which the great majority of working pathologists have accepted. Scrofula and tuberculosis are considered to be distinct until further evidence of their identity is forthcoming. "The scrofulous person is frequently tuberculous, the tuberculous person is usually scrofulous; the non-scrofulous person may, however, die of tuberculosis, while the individual may be scrofulous without containing tubercle."

On the question of morbid growths the author takes safe ground in admitting that certain tumors are due to congenital peculiarities of tissue and even represent atypical growths from embryonal tissue, but the theory of such an embryonal origin for all tumors seems unnecessary. The influence of traumatic irritation in occasional instances cannot be denied.

If in this article of Dr. Fitz we must feel a little disappointed in such close adhesion to his German masters, and perhaps in a too-marked obliteration of his personality, we can at any rate congratulate him on a concise and clearly expressed statement of the subject, one to which many will turn for reference and information.

General Etiology, *Medical Diagnosis*, *and Prognosis*, by Dr. Henry Hartshorne, present a fairly satisfactory statement of the points usually considered under these headings. The germ-theory is discussed at length, but not in a very critical manner. The fundamental facts relating to cultures in series are not mentioned, and the author has evidently not grasped this part of his subject in the spirit of modern inquiry.

Dr. John S. Billings deals with the subject of *Hygiene* in connection with the duties of the general practitioner. The causes of disease, the means of discovery and prevention are first considered in a series of practical sections full of knowledge of a most useful kind. Thus under *Habitations* a surprising amount of information is conveyed in a few pages, and the various points on which the family physician is usually consulted are given without unnecessary technical details. The principles of isolation and disinfection are discussed in that practical and lucid manner which characterizes all of Dr. Billings's writings on sanitary matters. Under personal hygiene, a timely warning is given to physicians in regard to the preservation of their own health, about which they are notoriously careless. The mortality of physicians under thirty is stated to be higher than that of any other profession during the same period of life. To learn "to reck his own rede" is a hard lesson in the busy round of practice.

The numerous and important relations of the physician to public hygiene are briefly considered, particularly in connection with registration of vital statistics and the prevention of the spread of contagious diseases. The reporting of births is rightly held to be the duty of the householder, who should also (or the undertaker) furnish the data as regards nativity, etc., in the death certificate, in which the physician should be called upon to state only the cause of death. In connection with the vexed question of the compulsory notification of diseases, the author holds that here, too, the parent or householder should be responsible. The duties and difficulties of health-boards and health-officers are alluded to in a few concluding paragraphs, and the importance of special training in dealing with the problems of hygiene is duly insisted upon.

The paper on *Drainage and Sewerage in their Hygienic Relations*, by Geo. E. Waring, Jr., supplements in an admirable manner the article by Dr. Billings. The question is considered, 1st, in connection with the removal of human excrement; and 2d, the removal of liquid household wastes. To effect the former, water-carriage is recommended as the best and safest system, provided an immediate and complete washing away of all foul matter is obtained. For buildings not connected with a sewer system the dry-earth method is advised, and the use of dry ashes or earth in the close-stool of the sick chamber to secure deodorization is suggested as a most simple and cleanly device. For the removal of liquid wastes an outline of a system of house-drainage is given, and without entering into detail, such directions and information are afforded as will enable the physician to pass judgment on plans submitted for his approval.

By far the larger part of the volume is occupied with a consideration of "general diseases from special morbid agents operating from without."

Dr. James H. Hutchinson, of Philadelphia, writes the articles on *Simple Continued Fever*, *Typhoid and Typhus*. The existence of the first-named disease is still questioned, and in this country many of the cases classed as such are undoubtedly instances of mild or abortive typhoid, while others are the result of exposure to excessive heat which seems to be the chief cause of the ardent continued fever of the tropics. Recognition may be accorded the disease on the understanding that it is an affection of varied causation characterized by slight pyrexia lasting from two or three to ten days. In this country cases of fever in children and young adults of one, two, or three days' duration are not uncommon, beginning with intensity and resembling in the general symptoms the initial stage of the eruptive fevers, and to such the term ephemera or simple fever is applicable. Cases of longer duration, eight, ten, and twelve days, are often examples of mild typhoid, and by many practitioners the term simple continued fever is applied to all examples of this disease in which the symptoms do not assume a severe form.

The paper on *Typhoid Fever*, just one hundred pages in extent, has evidently been prepared with great care. The name of typhoid is, we think, wisely retained as the one originally given by Louis, and best known in this country and abroad, and the other names, enteric, pythogenic, and intestinal fever, are open to the criticisms applied to it.

In the account of the history of the disease a brief notice is given of the references by Willis, Sydenham, Huxham, and others to a disease which from the description was certainly typhoid. Under the designation "slow nervous fever," Huxham gives an admirable description of typhoid, and distinguishes it from the putrid malignant petechial fever, which was unquestionably typhus. To the French observers, Bretonneau, Petit and Serres, Louis, Chomel, and Andral, we owe a thorough knowledge of the clinical and anatomical appearances, particularly to Louis, whose great work appeared in 1829. The steps by which the profession reached a knowledge of the distinctions between typhoid and typhus fever are briefly stated, and full justice is done to the work of American physicians. Indeed, the question of the non-identity of the two diseases was generally accepted here many years before it was in Great Britain and in parts of the Continent. To Dr. W. S. Gerhard, of Philadelphia, is rightly awarded the honor of the first careful and complete statements of the differential diagnosis between the two diseases. Nathan Smith, in 1824, gave a good account of typhoid under the name of typhous fever of New England, and the able memoirs of James Jackson, Sr. (1838), and Enoch Hale (1839) of Boston, were largely instrumental in diffusing a knowledge of typhoid as a disease distinct from typhus. Dr. Hutchinson attributes the *Report on Typhoid Fever*, communicated to the Massachusetts Medical Society in 1838, to the younger Jackson, but he had been dead several years when his father wrote the memoir referred to. The paper by Dr. G. C. Shattuck, of Boston, in 1838, before the Medical Society of Observation, of Paris, on the differences between the typhus and typhoid fevers, influenced powerfully French professional opinion. Valleix also refers to a paper by Dr. Alfred Stillé, of Philadelphia, on the same subject, read before the same Society in 1838, which, as far as we know, has never been published. Bartlett's work on the *History, Diagnosis, and Treatment of the Fevers of the United States*, 1842, contributed to make the distinction between the diseases thoroughly known to the profession here. It is curious how widespread the opinion is in Great Britain that to Sir William Jenner is due the credit of first accurately distinguishing between these diseases, but in reality his important observations, 1849 to 1851, came at the end of a long series, and settled the question in Great Britain only; elsewhere the non-identity had been accepted for some years. The New Sydenham Society has recently republished Dr. A. P. Stewart's paper on this subject, read in Paris in 1840, and, among British writers, to him is due the merit of first recognizing the distinction we now know so well. The etiological relations of the disease are discussed at length. Certain interesting questions have been settled by the immense mass of information which has accumulated in the past fifty years, such as the greater prevalence of the disease in summer and autumn, and the greater liability of the young to attack; but other problems remain for solution, as the relation of moisture and temperature, and the rise and fall of the ground water, to which Buhl and Pettenkofer attribute so much influence.

The author agrees with Murchison and Liebermeister in not regarding the disease as contagious, and the occurrence of several cases in the same house, and the limited epidemics following the arrival of an infected person in a locality, are satisfactorily explained. There is no doubt that the feces contain the poison, and yet they appear to be harmless in the fresh state, as we rarely find nurses and hospital attendants affected, whose duties necessitate handling the fresh stools, to the emanations of which in any single case they must be exposed scores of times. Some change is necessary before they become virulent, but of the nature of this we are still ignorant. That the occupants of houses connected by ill-trapped drains with sewers into which typhoid discharges have been thrown are so liable to attack would appear to prove that sewer-gas alone was capable of conveying the poison, but the instances are rapidly multiplying to show that the contamination of water by infected sewage is the most fruitful source of outbreaks. Of these methods of infection many illustrative cases are given. On the question of spontaneous origin, the author says that, "after the elimination of all doubtful cases, there yet remains a certain number in which it is reasonably certain that there has been no recent importation of typhoid fever germs, as in the case which is reported by Metcalfe, and which occurred on Norfolk Island, and in that recorded by Low. The assumption does not seem an unwarranted one, that in these cases the poison of the disease, which had been present before in a latent condition, had suddenly been called into activity by favoring influences." The bacillus typhosus is dismissed with a brief paragraph and the specific connection regarded as not proven. The period of incubation is placed at between two and three weeks, "but in many cases it does not exceed ten days, and in rare instances has unquestionably been very much less." The clinical description is in all respects admirable, and occupies nearly a fourth of the article; no point, even the most trivial, seems to have been overlooked. In the section on complications and sequelæ, there might have been a more extended reference to the surgical affections so well described by Keen in his Toner Lecture. Separate accounts are given of the special features of typhoid fever in children, and in aged persons. Considering the frequency with which practitioners in country districts appear to meet with typho-malarial fever, somewhat fuller details might have been given of typhoid as modified by malarial influence, but a careful study of the cases with the help of Dr. Hutchinson's clinical description will, we feel sure, enable these anomalous forms to receive due recognition.

The diagnosis of typhoid fever rarely presents difficulties to the hospital physician, but in country parts, where malaria prevails, cases occur the nature of which is not easily settled; particularly is this the case with the remittent fevers which sometimes resemble typhoid very closely, and in which a low asthenic state may supervene. There are instances in which, from the clinical features alone, it is impossible to say whether we are dealing with a prolonged remittent fever in which the patient has lapsed into a typhoid state, or whether it is a case of enteric fever modified by the presence of the malarial poison. From typhus and the eruptive fevers there are not often serious difficulties in distinguishing typhoid. In the post-mortem room, where errors in diagnosis are pitilessly exposed, we have noticed specially the frequency with which acute tuberculosis and ulcerative endocarditis appear to be confounded with typhoid. Cases of pneumonia in debilitated persons may simulate typhoid very closely, and again we have repeatedly seen instances in which the severe nervous symptoms, the twitchings, etc., have led to the diagnosis of meningitis, cerebral or spinal, or both.

In the treatment of the disease the rules laid down for the management of ordinary cases are those everywhere recognized as suitable—rest, careful diet, of which milk forms the chief ingredient, and vigilant nursing. Small doses of quinia and the mineral acids are given, and where the tongue is very dry and there is much meteorism, turpentine and ten-drop doses every two hours, as recommended by the Dublin physicians and by the late Dr. Geo. B. Wood. Among one hundred typhoid cases seventy-five per cent. will require no other treatment, and this number at least we can be sure of saving in any hospital and under any management, specific, hydropathic, or purely expectant. The battle is over the remaining twenty-five per cent.; a variable number of these, from ten to fifteen, depending somewhat on the type of the epidemic, are absolutely hopeless cases, either from the malignity of the fever or the occurrence of severe complications. With the remainder, the physician's success will depend much upon the readiness with which he detects indications for treatment and the promptness with which he meets them. Among these indications the pyrexia takes a prominent place. Like most American and English physicians, Dr. Hutchinson, while acknowledging the advantages of the cold bath, is indisposed to have recourse to it "except in cases of hyperpyrexia of such intensity that death seems imminent, and only to be averted by energetic treatment, or in cases in which other antipyretic remedies have failed to reduce the temperature." He thinks it possible by the cold pack and sponging to get very much of the antipyretic effect of the bath. The action of quinia in doses of from fifteen to twenty grains, repeated if necessary, is held to be of service in reducing the fever. Sodium salicylate has been disappointing. The more recent and very favorable action of antipyrin is not alluded to, having been introduced subsequent to the preparation of this paper. The author refers briefly to the specific treatment by calomel and by iodine and carbolic acid, and while he condemns the former holds that the latter should receive a full trial.

Typhus Fever, also by Dr. Hutchinson, is not so fully considered; nor does its importance demand anything like the same extended notice. Fortunately it is now an affection rarely seen, and to the great majority of physicians in this country it is practically unknown. In New York, Philadelphia, and some of the larger cities, slight outbreaks, or sporadic cases occur, but the conditions of filth and overcrowding, so indispensable for its progress, do not obtain in the same manner as of yore, and sanitary measures for its suppression are easily and effectually put in motion. Since 1866, no epidemic of any extent has prevailed in the eastern cities. The returns of typhus fever cases during the war of the rebellion are generally believed to be erroneous, the disease having been mistaken for typhoid, occurring in scorbutic subjects. The general description of the symptoms, complications, morbid anatomy, and sequelæ leaves nothing to be desired.

Relapsing Fever is a disease so rarely met with in this country that the article by the Editor seems unnecessarily full and prolonged, but the subject is a fascinating one in itself, and one which Dr. Pepper had carefully studied in the epidemic which prevailed in Philadelphia in 1869–70, and such an extended description is perhaps in keeping with the range of this work.

The Philadelphia epidemic, the clinical material of which serves as the basis of the article, did not favor the view that starvation and destitution play a special *rôle* in the etiology, as the majority attacked were among the well-fed; but over-crowding was a very important factor. Neither age nor sex exerts any special influence. The negro race showed a greater susceptibility than could be accounted for by the greater overcrowding existing among them. Recent residence in the city was not noticed to have any special predisposing influence, as observed by Murchison in the London epidemics. Once the virus has developed, contagion is the essential cause of the spread of the disease, and the author regards the contagiousness as intense as in typhus, and the poison may also be carried by fomites. A full account of the spirillium Obermeieri is given, but fuller details are thought necessary before we can be certain that it is the specific contagious principle. The close connection of the spirillium with the febrile paroxysm, the inoculation of it in monkeys, and in some instances in man, with the production of the disease after a definite period of incubation, furnish details as full as we are likely to procure for some time, and should, we think, convince all but the serenely obstinate. The clinical description derived from a very careful study of the epidemic of 1869–70, at the Philadelphia Hospital, forms the most valuable part of the article, and represents a large amount of original work by the author and his colleague, Dr. Rhoads. With the assistance of Dr. Horace Hare, elaborate investigations on the urine were also made, the results of which are embodied.

The morbid anatomy is very fully considered, and the author believes that the existence of important and characteristic lesions has not been sufficiently recognized. Certainly the constant occurrence of the spirochæta in the blood may be regarded as a characteristic lesion, but with this exception the other changes in the blood and alterations in the viscera—ecchymoses, infarcts, swelling of the lymphoid tissue of the spleen, cloudy swelling, etc.—while important, can scarcely be regarded as distinctive. The mortality in the Philadelphia epidemic was rather high, 14 per cent., and the negroes suffered more severely than the whites. In the treatment of the disease, the ordinary antipyretics failed to give any satisfaction, and neither quinine nor arsenic had the slightest influence in postponing the paroxysms.

The editor has followed German usage in assigning the subject of *Variola* to a dermatologist, but Dr. J. Nevins Hyde, of Chicago, is well known as a man whose specialism has a broad foundation in general medicine, and in this particular disease he has had opportunities for making special studies. Not only is smallpox truly the great skin disease, from the terrible ravages which it may make in this structure, but there is probably no one affection in which so many different forms of cutaneous rashes may be studied. Besides the papular, vesicular, and pustular eruptions, there is a great variety of other rashes—erythematous, measley, petechial, etc.

The nature of the contagion is unknown: "There is at present no proof that any bacteria, vegetable germs, or other minute organisms foreign to the human body, are the essential causes of the disease."

In the description of the period of invasion, no mention is made of nausea and vomiting, which are among the most frequent and distressing symptoms. We have an excellent account of the initial rashes described by Hebra and Simon, which are now invariably regarded as important diagnostic features. The erythematous and petechial rashes are the most frequent; the former may be general, and the case may be mistaken for scarlatina or rubeola; they may, however, be limited to the groins, axillæ, or inner surfaces of the thigh (Simon's triangles), which are the situations most frequently the seat of the petechial eruptions. Less common forms are rubeoloid, local or diffuse, and the eruption of urticaria. A knowledge of these prodromata and their significance is undoubtedly of great service in the early diagnosis of many cases of smallpox, but we have known it to be just the reverse, as in two instances of measles sent to a smallpox hospital under the impression that the rash was an initial one. Care should, however, prevent any such mistake. On the whole, we agree with Knecht and Curschman that the occurrence of the rashes is often a favorable symptom and indicates a mild course. They certainly precede varioloid more frequently than variola.

A good description is given of hemorrhagic variola, several types of which are recognized. They vary in different epidemics, and the author rightly says: "At one extreme are classed the inevitably fatal cases, where the patient sinks smitten with the malady even before the exanthem is developed; at the other are found cases of confluent variola not necessarily fatal, in the course of which hemorrhagic lesions appear in variable numbers." The remarks on diagnosis are well to the point. In the invasion stage "the occurrence upon the centre of the two cheeks of a vivid damask-red blush," circumscribed in area, is a symptom which Dr. Hyde has noted in many cases. Here, again, though gastric distress is spoken of, the author does not lay stress enough upon the vomiting. The triple combination of fever, intense pain in the back, and vomiting is, in some epidemics at least, almost pathognomonic, and time and again we have known all necessary precautions for isolation taken on their occurrence.

The directions for treatment are explicit and sound. The use of water compresses is recommended for the eruption, used tepid, with a drachm of boracic acid in each pint of water.

The articles on *Vaccinia* and *Vaccination* are from the pen of Dr. Frank P. Foster, of New York. The nature of vaccinia is carefully discussed, and the author accepts the conclusions of the Lyonnese commission, recently confirmed in England by Fleming, that smallpox and cowpox are wholly distinct from each other, and he rightly characterizes as most reprehensible the practice of inoculating cows with smallpox for the purpose of obtaining vaccinal virus. The old notion, however, is not yet dead, and in England has still active advocates. Of its derivation from horsepox there is also no evidence. It has been shown that the virus of horsepox may be used for the purposes of vaccination, and epidemics in horses have been known to occur simultaneously with the prevalence of smallpox. It is most natural to regard the vaccinia as a disease *sui generis*.

The general course of the disease, various irregularities, and the pathological anatomy are considered at length. To one interesting irregularity we may briefly refer, viz., the so-called generalized vaccinia. Most of these are instances of the accidental transference of virus from the pock by scratching. The author has never seen a general eruption as a consequence of constitutional infection, but does not question the occurrence of such instances and of their liability to be confounded with variola. During the prevalence of an epidemic of smallpox it is not very uncommon to have a recently vaccinated person attacked with the disease, and the question may be a very nice one, whether the eruption is generalized vaccinia or actually variola. The author thinks "failure of the secondary fever of smallpox, together with the fact that the disease does not spread by infection, will generally suffice to decide it." The distribution and mode of development, the occurrence of the rash on the pharynx, may also be of service, but certain cases prove very puzzling.

The various questions connected with vaccination are fully considered, including the important subject of vaccinal syphilis, the existence of which is now universally recognized. And, lastly, the technics of vaccination are described, and the merits of bovine and the humanized virus compared, greatly to the advantage of the former. In only one respect, promptness of action, can the latter be said to be superior; in all other particulars it is inferior.

The brief article on *Varicella* by Dr. Hyde does not call for special comment, but his remarks on the relation of the disease to variola are interesting: "Practically and clinically it is useful to regard these disorders as of a distinct nature. The arguments, however, in favor of such absolute distinction are not irrefutable. There is probably in both forms of disease a single virus, that of variola; but this, modified by evolution among generations of vaccinated children, has, in this process of natural cultivation or attenuation, produced a malady of tender years, whose attacks do not protect from variola and occur irrespective of vaccination."

The subject of *Scarlet Fever* is exhaustively considered by Dr. J. Lewis Smith, of New York, in an article extending over seventy pages, in which every question concerning this important disease is minutely discussed. In spite of the assertions of Klebs, Eklund, and others, we do not appear to have ascertained a specific micro-organism in the disease—at least one which conforms to Koch's law. But, whatever the virus is, we know well its remarkable tenacity, unsurpassed by that of any other eruptive fever. Many interesting illustrations are given of the extraordinary fixity of the poison. The incubative period is ordinarily within six days, but owing to individual differences and susceptibilities it may be postponed for twelve days.

From a careful study of the literature of surgical scarlatina Dr. Smith concludes that considerable proportions represent genuine cases, but in others, perhaps an equal number, the histories and symptoms indicate septic efflorescence. The presence or absence of faucial trouble is of great importance in distinguishing between these conditions. The same difficulty occurs in the so-called obstetrical scarlatina, and we have here also the genuine instances of scarlet fever and others representing the efflorescence of septicæmia.

The clinical features of the mild and malignant forms are accurately drawn, and nearly one-third of the article is taken up with the important complications and sequelæ. The throat troubles receive full consideration, and the acute cellulitis and adenitis are described at length. We miss an account of the chronic lymphadenitis which may be left after scarlet fever and persist for years, to the great disfigurement of the patient and annoyance of the physician. On the relation of the pseudo-membranous inflammation of the fauces to the disease the author holds strong convictions that "when pseudo-membranes occur on any of the inflamed mucous surfaces in scarlet fever, true diphtheria has with few exceptions supervened, if the patient live in a locality where diphtheria is prevalent." Interesting cases are given in illustration of scarlatinal rheumatism with endocarditis, and also of the serious complication with pericarditis, and of the formation of heart-clot. Due attention is called to the frequency of catarrh of the renal tubes, which has been thought to be as common as that of the bronchial tubes in measles; by the stimulus of cold it is liable to be aggravated to a positive nephritis. The tubal and interstitial changes in the kidneys in scarlatinal nephritis are fully described, the author following in the main the account of Klein.

The section on treatment is very extensive. The use of boracic acid as a possible antidote to the scarlatinal poison is recommended from the beneficial effects witnessed by the author recently in seventeen families. Full directions are given for the disinfection of rooms and clothing. The very specific details of the mode of treating mild and severe cases and for the management of the complications and sequelæ will be read with great satisfaction by practitioners, who will here find many valuable suggestions.

The articles on *Rubeola* and *Rötheln* are by Dr. W. A. Hardaway, of St. Louis, and show careful preparation and wide reading. They are written for the student and practitioner, and all superfluous details and references are wisely omitted. Rötheln is a disease with which American physicians are not yet sufficiently acquainted, and this paper will assist in diffusing very clear and positive information on the subject.

The *Malarial Fevers*, by the late Dr. Samuel M. Bemiss, of New Orleans, are considered under the three divisions: intermittent fever—simple forms; remittent fever; and pernicious malarial fever. The clinical features of each are accurately depicted, but the arrangement of the subject-matter is not always orderly. We miss a discussion upon the pathology of the disease, and no reference is made to the numerous recent investigations. The articles are of value as embodying the personal experience of a man who practised almost half a century in malarial regions.

Parotitis, *Idiopathic and Symptomatic*, is briefly described by Dr. John M. Keating, of Philadelphia. Ordinary mumps is certainly one of the most curious of the zymotic diseases, with its special localization and tendency to metastasis. We have no knowledge of the nature of the contagious principle or of the laws regulating its outbreaks. Epidemics, too, vary much in intensity and in the frequency with which the secondary manifestations appear. Evil consequences are rare, even after orchitis. Deafness is a serious complication, which Dr. Keating does not mention but of which a good many cases have been reported.

The article on *Erysipelas*, by Dr. J. Nevins Hyde, of Chicago, contains everything necessary from a practical and clinical standpoint, but in other respects it seems rather behindhand. Certainly mention should have been found of Fehleissen's remarkable investigations, made some two or three years ago, which have been extensively confirmed. We are aware that many of the articles for this volume were on hand some time ago, and the date 1885 on the title-page is in this respect misleading. In a medical consideration of erysipelas we should have liked to see a fuller account of the cerebral, pulmonary, and renal complications, some of which have been specially studied by American authors.

The late Dr. Bemiss, of New Orleans, discusses the subject of *Yellow Fever* in a manner altogether too brief for a disease of such importance, and in a work which should be a standard of reference for physicians in all parts of the country. The clinical details are most meagre. Some interesting facts are gleaned from the epidemic of 1878. The contrast is very striking between the mortality in the Charity Hospital, 50 per cent., and in the private practice of four of the leading New Orleans physicians, 7 to 10 per cent. The section on treatment is full and suggestive.

No one but Dr. Jacobi, of New York, could have appropriately written the article on *Diphtheria* for a work on medicine by American authors. For more than twenty-five years he has been one of the most ardent students of the disease, and his treatise on the subject is the best in any language. Dr. Jacobi's views on the disease are too well known to the profession to require a lengthy notice. The advocates of the parasitic origin of the disease still find in him an unsparing opponent, and certainly in this disease we can agree with him that the bacteria question has not come any nearer its solution. We are still sorely in need of more positive information upon the etiology of this formidable affection. The author is not convinced that it is a sewer-gas disease; water and milk as agents in conveying the poison are doubtful. Many interesting details are given of the contracting diphtheria from animals. Hens and calves are very liable to it, and men have directly caught the disease from contact with them. Cats also suffer with it, and have taken the disease from children, and we know of an instance in which the opposite was believed to be the case. The question of the distinctions between croupous and diphtheritic inflammations has been re-opened by the recent emphatic statements of Virchow, who adheres to his old views. Whether membranous laryngitis (croup) is always a true diphtheria still perplexes the profession. Dr. Jacobi has long affirmed their identity, and on his side are now ranged a majority of the leading authorities on the subject. More than one-third of the article is devoted to the section on treatment.

With the disease at our doors, so to speak, few sections of the volume will be more carefully read than that on *Cholera*, by Dr. Alfred Stillé. It is an able exposition of our existing knowledge, written by a man who has had personal experience in nearly all the epidemics which have visited this country. The historical account is most interesting, and we can reasonably hope, from the comparatively limited extent of the outbreaks in 1866 and 1873, that, should the disease arrive this year or next, its ravages may be restricted. We naturally turn to the subject of the pathology to ascertain Dr. Stillé's views on the recent developments in this direction. That the chief factor in the disease is the gastro-intestinal flux induced by some specific poison which originates in Hindoostan every one admits, but of the nature of the poison we have only surmises. The recent investigations of Koch, a summary of which is given, certainly harmonize with the long-prevalent opinion that the poison consists of certain microscopic germs. We gather that the author does not consider Koch's bacillus as fully proven to be the *materies morbi*, and he very rightly calls attention to the fact of their rapid death when dried as particularly open to criticism. That cholera fomites may preserve their infectious qualities for weeks or even months is a well-established fact. Witness the importation of the disease into this country in 1873, when it was brought by immigrants who remained healthy on their voyage and after landing until they reached far distant points inland, when their effects were unpacked, and the disease broke out with great fury. Whether cause or only concomitant the comma-bacillus will certainly be of use in diagnosis for the constancy of its presence in cholera, and its absence in other conditions seems to have been fairly well established by the more recent investigations.

The author's remarks on the value of quarantine are most timely, and he condemns, in no measured terms, the resolutions of the Medical Congress of 1875, and of the German commission, which oppose quarantine as detrimental to the interests of commerce. The history of the Staten Island Station as given by Dr. Peters is a powerful argument: "There have been fourteen epidemics of cholera at Staten Island, and only four have reached New York."

The subject of *Leprosy*, dealt with by Dr. James C. White, of Boston, has aroused a good deal of interest lately in the profession of the country, and the local endemics have been carefully studied. The cases occur among the French in Louisiana and New Brunswick, the Norwegians in Minnesota, and the Chinese in California. Fortunately there does not appear to be any danger of an increase, for on the Pacific coast, where there have been a greater number of cases than in any other locality, in no single instance has the disease been acquired in this country. The infectious nature of the disease is very strongly supported by the history of the disease in the Hawaiian Islands; and Dr. J. E. Graham, who has made the only exhaustive study of the leper settlement at Tracadie, N. B. (a colony which was believed to favor strongly the hereditary view), finds that the facts show very clearly that the disease was propagated from one person to another by contagion The bacterial nature of the affection appears pretty well established, and furnishes a satisfactory basis of explanation of all facts, historical, clinical, and pathological.

One of the most important contributions in the volume is Dr. Stillé's article on *Epidemic Cerebro-Spinal Meningitis.* It is an elaborate study of a disease which has prevailed most extensively in America, and has been known here almost as long as in Europe. The sketch of the various outbreaks since the first one at Medfield, Mass., in 1806, shows how widespread it has been. In Philadelphia it appeared first in 1863, since which date until the present (1884) it has never failed to appear among the causes of death. We doubt the propriety of setting down to the account of epidemic meningitis all the cases returned as such. Many physicians apply the term to any case in which with fever there have been twitchings of the muscles, delirium, signs of spinal trouble, and from post-mortem experience we have very small faith in the average diagnosis of cerebro-spinal meningitis. It is the same with veterinarians in many parts of the country; the diseases to which the name is applied are numerous, and on dissection of the animals cerebro-spinal inflammation is usually absent. The disease does occur epidemically in horses as in men, but what we contend is that, although in the intervals between epidemics sporadic cases do occur, these are few in comparison with the medley of affections which the ordinary practitioner tickets with the name cerebro-spinal meningitis.

The erratic characters of the epidemics are well illustrated, and the variable phenomena of the disease in different outbreaks. In no one feature is this more marked than the cutaneous symptoms. So constant are the petechiæ and extravasations in some epidemics that it has received the name of the spotted fever and malignant purpura, while in others they have been altogether absent. In the rapidly fatal hemorrhagic cases the diagnosis is very difficult from malignant (black) smallpox or scarlet fever. The descriptions of the individual symptoms and morbid anatomy are well drawn, and did space permit there are several points to which we should gladly refer. The whole article is one of special merit, and presents a peculiarly American disease from a local standpoint in a manner which will be highly advantageous for the future study of the affection.

The subject of *Pertussis* is very ably considered by Dr. John M. Keating, who believes the disease is caused by a special germ which excites the catarrh of the air-passages, a condition which exists for a variable period, and is influenced by such remedies as quinia and alum; and he also holds that there is a neurotic element which follows the initial catarrh, and may last for an indefinite time after the mucous membrane is normal.

The paper on *Influenza*, by Dr. James C. Wilson, of Philadelphia, gives an accurate and full description of an epidemic disease which is apt to be regarded too lightly by the profession and the public. The relations of the disease to the epizoötics in horses and cattle need more careful study. In some instances the affection seems to have originated among the horses and spread subsequently to men; in others the reverse has occurred.

Dengue is a tropical or semi-tropical disease, rarely seen in this country, about which we lack satisfactory details in many points. The article by Dr. H. D. Schmidt, of New Orleans, contains a good summary of the facts at present known, and full use is made of valuable observations made lately in the Southern States, where the disease has appeared in several localities.

Professor Law, of Cornell University, has written the papers on *Hydrophobia*, *Glanders*, and *Anthrax*, and has furnished an able presentation of these diseases as occurring in animals and man. In some subjects the details could have been amplified, as in the paper on anthrax in man, in which we find no mention of "wool-sorter's" and "rag-picker's" disease, which has been shown to be anthrax.

The subjects of *Pyæmia* and *Septicæmia* are discussed at length by Dr. A. B. Watson, of Jersey City. Too much space is occupied with the consideration of questions of etiology and pathology on which such confusion still exists. By careful studies, such as those of Koch, Rosenbach, and others, we may hope in time to reach positive conclusions on the connection of micro-organisms with the various inflammatory processes ending in the formation of pus, and on the relation of these to each other, but meanwhile the difficulty of framing a clear statement of the case is by no means diminished. In the very next section Dr. Lusk, of New York, enters very fully into the same question in connection with *Puerperal Fever*, now rightly regarded as an infectious disease due to septic inoculation, and he marshals in orderly array a most convincing series of facts in proof of the modern views. Into many of the interesting problems of this disease we should like, had we space, to follow Dr. Lusk, but, as the paper forms one of the ablest and most comprehensive articles on the subject before the profession, it is certain to be widely read and appreciated, and special criticism is less called for.

There are two articles in the volume on diseases which are fortunately not met with in America, the *Plague*, by Dr. James C. Wilson, and *Beriberi*, by Dr. Duane B. Simmons, of Yokohama, Japan. The essay on the Plague is carefully prepared and shows wide reading. The historical interest connected with the disease is so great that the space allotted to it is well occupied.

The article on Beriberi is disappointing; the exhaustive articles of the past few years by several German investigators which throw light on the pathology of the disease are not made use of. The date of the most recent paper referred to is 1880, and the researches of Scheube and others, which point to a peripheral neuritis as the cause of the disease, were made since this date. No mention is made of the occurrence of the disease in the Sandwich Islands, where it is known to prevail extensively among the Chinese.

Taking the volume as a whole, it is not too much to say that with but one or two exceptions the articles are all of first class merit and comparable with the best productions of our foreign colleagues in similar works. The typographical execution is of the very best, and the errors are remarkably few. A good index accompanies the volume.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

A Triple-divided Pharynx.

Dr. E. **Hofmann** reports the case of a woman, aged 58, to whom his attention was attracted by her efforts at breathing, her long-drawn and piping respiration, and her livid color. Her voice also was nasal. The patient related that for twenty years she had suffered difficulty in breathing and swallowing. Sleep was possible only in the sitting position, and was frequently broken by cough, during which foam was ejected and a feeling of suffocation experienced which compelled her to leave her bed and seek fresh air. For five years she had been unable to take solid food, and only with difficulty was she able to swallow water, broth, milk, and other fluids, which for the most part escaped through the nose when attempt was made to swallow them.

Examination of the pharynx revealed the cause of the trouble. The pharynx was apparently divided into an upper, or pharyngo-nasal, a middle, or pharyngo-oral, and a lower, or pharyngo-laryngeal, portion by horizontal partition walls. In addition, the separation of the retro-pharyngeal space from the middle portion of the pharynx—a condition not seldom met in syphilis—was accomplished as follows:—

The patient's soft palate, as a result of syphilis, was in part destroyed and in part converted into an immovable strip of cicatricial tissue, which had grown fast to the posterior wall of the pharynx, near the arcus pharyngo-palatinus, thus forming a cleft about three-fifths of an inch long and one-fifth of an inch across in its transverse diameter, through which the middle and upper portions of the pharynx communicated. Close to the upper portion of the cleft the uvula was found much displaced, but well preserved. The laryngeal mirror placed before this cleft did not bring into view either the inferior pharyngeal cavity, the root of the tongue, the epiglottis, or the larynx.

The inferior pharyngeal space was almost entirely separated from the middle by a partition wall. The posterior portion of the tongue was in its entire breadth united with the posterior and lateral pharyngeal walls. In addition there was present, on either side, a horizontal, dense, cicatricial band as broad as a finger nail, while on the right and the left side of the pharynx was found a somewhat deep blind pocket, through which a sound could not be introduced.

Between the two cicatricial bands and at the centre of the space careful inspection revealed the presence of a small opening, which led into the lower cavity. This passage was round, covered with foam, and scarcely large enough to admit a catheter of moderate size, and was the sole communication between the external buccal orifice, the œsophagus, and larynx for the passage of air and food.

Dr. Hofmann successfully applied the galvano-cautery to the cicatricial right band, which was found to be less superficial than it appeared at first sight. After the application the tracheal sound was introduced with marked improvement in the respiration of the patient. Hemorrhage during the operation was unimportant.

At a second operation the left side of the inferior pharyngeal space was opened, and the epiglottis was found in great part to be absent, only a small stump remaining.

Examination made four days after the second operation showed the pharynx to be funnel-shaped in the region of the epiglottis, and the patient was now able to eat and drink *ad libitum*, and to breathe and sleep without difficulty. A third attempt to remove a slight remaining constriction caused such profuse hemorrhage that, after ineffectual effort to check it having been persisted in for an hour and a half, tracheotomy was performed, and the pharynx tamponed. This measure was successful, and hemorrhage not recurring, the patient was discharged cured.—*Deutsche Medicinische Wochenschrift*, July 9, 1885.

Congenital Malformation of the Heart. Existence of a Canal by which a Communication between the Right Ventricle and the Origin of the Aorta was established.

M. A. CAYLA reports, in *Le Progrès Médical* of August 15, 1885, a rare congenital malformation of the heart. The subject—a child aged ten days—during life exhibited symptoms of defective circulation and of asphyxia. Post-mortem examination revealed the following anomalous condition of the heart:—

The organ was considerably increased in volume, globular, and filled almost entirely the left side of the chest, so that the lung on this side could not be seen, while that on the right was of normal size. Further examination showed the left lung to be only one-third the normal size.

The heart was of the shape of a triangular prism, presenting an anterior, a posterior, and a right face formed by the right ventricle. In height it measured three inches, and had a breadth of two and one-half inches. The right ventricle constituted at least two-thirds of its entire volume, while the left was consequently considerably diminished.

On cutting through the apex it became evident that the right ventricle was divided into two cavities.

On the left of the interventricular septum, at its inferior limit, the knife reached a third cavity—the left ventricle, so situated that the apex of the heart was entirely formed by the right ventricle. Section of the two cavities of the right ventricle showed two passages, the one normal, the other abnormal, and leading to the origin of the aorta at a level with the sigmoid valves. Communication also existed between the left ventricle and the aorta. Three incisions thus revealed three cavities, two ventricular and between them a third hollowed in the tissue of the heart, and separated from the right ventricle by a partition two-fifths of an inch in thickness, and from the left by a partition of normal thickness, which at no point presented a solution of continuity.

The direction of the canal was oblique, opening by its lower extremity into the right ventricle and terminating above in the aorta. It was funnel-shaped, and at the inferior portion could receive the end of the little finger, while at its termination in the aorta its dimensions were those of a quill.

The aorta valves were present, but exhibited irregularities on their surface. The walls of the aorta were thin. The remaining valves of the heart were normal.

M. Cayla, under the direction of Prof. CORNIL, has sought and failed to find record of any similar anomaly of the heart, and concludes that this case, if not unique, is at least very rare.

Anomalies in the Development of the Hymen.

Dr. R. DOHRN, in the *Zeitschrifte für Geburtshülfe und Gynäkologie*, Band XI. heft 1, gives the following summary of the principal anomalies of development observed in the hymen, the author first stating that the normal form of the hymen is the annular, with predominance of the posterior portion, and the approximation of the hymeneal orifice toward that of the urethra.

The orifice of the hymen rarely occupies the centre of the membrane, and admits the annexed eight varieties of abnormal hymen :—

1. The denticulate hymen serrated in contour, frequent.
2. The fimbriated hymen with broken edges.
3. The infundibuliform hymen with the edges drawn above, not rare in the new-born, but found also in adults.
4. Hypertrophied hymen, rare, only two cases having been observed ; hypertrophy is partial, and is observed rather in the anterior portion.
5. Multiple hymen characterized by the existence below the hymen of a second partial membrane.
6. The divided or bifurcated hymen, whose orifice is divided into two portions by a partition generally vertical.
7. The columnar hymen, in which the partition is extended below the hymen into the vagina.
8. The cribriform hymen, in which in lieu of a single orifice there are numerous small ones.

Absence of the hymen is very rare ; it has been observed by Rose, Toulmouche, Tolberg, etc.

Displacement of the hymen toward the apex of the vagina has been observed by Krimer.

Anomalies in the texture of the hymen are very variable, ranging from that of a spider's web to the consistency of cartilage or bone.

Persistence of the hymen during pregnancy has been observed very frequently. Tolberg describes a hymen which remained intact after the expulsion of a fœtus of six months.

Atresia of the hymen is of all anomalies the one which attracts attention most frequently, and demands surgical intervention.—*Revue des Sciences Médicales*, July, 1885.

MATERIA MEDICA AND THERAPEUTICS.

Styptic or Hæmostatic Ether.

Dr. B. W. RICHARDSON (in *The Asclepiad* for July, 1885) calls attention to styptic or hæmostatic ether. He says : In first observing the influence of the cold produced by the dispersion of absolute ether during operations, nothing struck me more than the effect of the cold in immediately stopping the flow of blood. For a time, cold alone, when carried to a sufficient degree, prevents all venous and capillary hemorrhage, and even the hemorrhage from small arterial trunks. After a time, however, as reaction returns, and the vessels relax under the influence of heat derived from the renewed circulation, there is bleeding, which, if a wound be closed too quickly, is a cause of after-trouble. The observation of the immediate effects of cold led me to think that if they could be supplemented by a styptic which would spray evenly with ether, and which would take up the constringing action when the vessels commenced to relax, an important desideratum in practice would be supplied.

With this object in view, I requested Mr. Robbins to make for me a solution consisting of absolute ether, having a boiling point of 95° Fah., charged to saturation at a low temperature with tannin, and afterwards treated with collodion, a little short of saturation. The compound came out well. It ran easily through the spray tube without blocking; it produced good local anæsthesia, and it possessed an agreeable odor.

In order to test to the extreme the effects of this preparation as a styptic, I took sheep's blood, removed, by whipping, all the fibrin previous to coagulation, and then let the blood remain exposed to the air for two days to insure partial decomposition. In this way the blood was rendered nearly as fluid as port-wine, and in the most unfavorable condition for being transformed into clot. A few drachms of this blood were now placed in a saucer, the saucer having been warmed to the temperature of the body. The spray of the styptic ether was then directed upon the blood from a full-sized spray tube, and in five seconds the whole mass of blood was so thoroughly solidified that the saucer could be turned upside down without any escape of fluid. The blood, which had previously presented the odor of putrefaction, was also deodorized, and remained inodorous for ten days. It had a firm, leathery consistence, and on its upper surface a fine whitish layer, with a bright vermilion color beneath.

These are the effects of the styptic ether on blood, the spontaneous coagulability of which has been lost; but they are trifling when compared with what takes place on blood newly drawn, and containing fibrin. In this case coagulation under the spray is the work of a second.

When styptic spray is directed on an open bleeding living surface, the primary effects are those produced by the cold—namely, the condensation and whitening of the tissues. If blood be flowing it solidifies, and when the parts relax, new blood that may ooze up enters the solid blood as though it were a sponge, the coagulation soon stopping further flow.

The elements of this process are three in number:—

1. The immediate constringent effects of cold on the bloodvessels.
2. The styptic action of the solution on the fibrin and albumen of the blood.
3. The extreme mechanical fineness of distribution of the fluid on the bleeding surface.

Styptic ether can also be applied to the hemorrhagic surface after the extraction of a tooth; for hemorrhage from cancerous disease of the uterus or other cause; and in cases of hemorrhage from piles.

I introduced styptic spray through the *Medical Times and Gazette* of April 26, 1866, have had it in regular service ever since, and have not once known it to fail in the uses first claimed for it.

The Application of Naphthol to Some Forms of Cutaneous Disease.

P. SOMBRET (*Thèse de Paris*) gives the following *résumé* of the advantages possessed by naphthol in the treatment of some forms of skin disease.

1. The preparations are odorless, and stain neither the skin nor clothing.

2. In the use of naphthol, with the precautions advised by Kaposi, there are observed neither forms of intoxication (albuminuria, coloration of the urine) nor active inflammation of the skin.

3. In scabies, naphthol is an excellent parasiticide and exercises a very beneficial effect upon the eruption due to the disease.

4. In pediculosis the remedy is efficacious, and its use is free from danger and inconvenience.

5. In psoriasis no satisfactory effect has been observed.

6. In prurigo (of Hebra) naphthol causes the itching to disappear rapidly, and has beneficial effect upon the eruption. It, nevertheless, does not possess a curative power in this disease greater than that possessed by other remedies.—*Revue des Sciences Médicales*, July, 1885.

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Pyrogallic Acid and Collodion as a Remedy for Psoriasis.

Dr. George T. Elliot, in the *New York Medical Journal* of September 5, 1885, recommends the following formula in the treatment of psoriasis :—

℞.—Acidi pyrogallici, ʒjss–ʒij.
Acidi salicylici, ʒss.
Collodii flex, ℥ij.
M. et ft. sol.

Keep in a dark-colored bottle.

The results obtained in treating psoriasis with the pyrogallic collodion have been in every way satisfactory. A great change could be seen in the lesions after a few applications. There was an absence of scales and a diminution in the hyperæmia, and the plaques and spots appeared less elevated. The time which was required in curing the psoriasis by means of this solution has naturally varied according to the extent of the disease and the length of time which it had existed. Any rule in regard to it could scarcely be made. The quickest results obtained were in psoriasis guttata, and the slowest in a case of psoriasis nummularis of long standing. In cases where the eruption is universal, or nearly so, it is of course advisable to treat the various portions affected *seriatim*. The results will be just as satisfactory ; only the time required will be longer.

In one other form of skin disease, herpes tonsurans, Dr. Elliot has used this solution of pyrogallic acid, and with most gratifying success. Its effect upon the lesions has been surprising, two applications having been sufficient in the majority of cases to effect complete cure.

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On the Failure of Salicyl-Compounds in the Treatment of Acute Rheumatism accompanied with Inflammation of the Genito-Urinary Mucous Membranes.

Dr. Thomas R. Fraser, in discussing the failure of the salicyl-compounds in relieving rheumatism complicated with gonorrhœa, thus gives expression to his views, holding :—

1. That many of the cases which have been considered to be gonorrhœal rheumatism were merely cases of toxæmia, produced by a toxic substance absorbed from an inflamed genito-urinary mucous membrane. The cases I refer to are met with especially among the examples of chronic mono- or oligoarticular inflammation.

2. That in other cases the disease is a rheumatism modified by toxic infection from a venereal or non-venereal inflammation of the genito-urinary mucous membrane. The rheumatic or toxæmic phenomena may in these cases be present in very different degrees of relative prominence, sometimes the rheumatic, and, at

other times, the toxæmic phenomena being the more prominent. This, the true form of gonorrhœal rheumatism, presents itself chiefly as an acute or a sub-acute disease.

3. That in no variety of gonorrhœal rheumatism is the progress of the disease materially influenced by the administration of salicyl-compounds; and as the distinction in acute, and even in sub-acute cases between gonorrhœal and ordinary rheumatism is always at the commencement, and sometimes during a great part of their progress, a matter of much difficulty, the failure of the salicyl-compounds in the former disease is a valuable assistance in diagnosis.—*Edinburgh Medical Journal*, September, 1885.

MEDICINE.

The Preventive Inoculation of Cholera.

At the late meeting of the Congrès de l'Association Française pour L'Avancement dés Sciences, held August 12, 1885, M. CHAUVEAU read a communication upon the preventive inoculation of cholera, in which the following conclusions were reached:—

1. The subcutaneous connective tissue is a region but little favorable for the proliferation of the pathogenic material of the cholerine virus and for the development of a malignant disease.

This tissue is accordingly very appropriate to serve as a point of introduction for the virus to produce an attenuated infection capable of exercising a preventive influence.

2. The slight resemblance which exists between the characteristics of this imperfect infection and those of true cholera cannot be invoked as a reason for denying *a priori* the choleraic nature of the slight symptoms produced by inoculation, and for denying absolutely the possibility of thus protecting against the natural disease. The efficacy of preventing inoculation is rendered probable by the example of numerous well-established analogous experiments which have been tried with great success in veterinary medicine.

3. In the well-known cases to which allusion has been made, and which especially concern peripneumonia and emphysematous charbon, virulent infection by the pathogenic material, properly so called, is undeniable, and is caused simply to produce immunity.

Soluble materials contained in the very minute quantity of the inoculated liquid do not exercise any save an indirect action upon the results of inoculation.

There is no reason to suppose that the ptomaïnes of bouillon in choleraic cultures exert any active influence, notwithstanding the relatively large quantity of bouillon injected in the inoculations of M. Ferrán.

4. The more perfect immunity which, according to the statistics of M. Ferrán, will be conferred by a second or third inoculation by an abundance of material, proves nothing in favor of the intervention of a soluble poison. It is, indeed, established in science, that the *same attenuated culture*, inoculated on different occasions *in very small quantities*, increase seach time the immunity against the action of strong virus, due to the multiple result of the infection produced by inoculation.

5. Tolerance of the human organism for large quantities of infectious bouillon can probably be explained not only by the unfavorable conditions afforded by the

region into which the bouillon is introduced, but more still by the feeble virulent activity of the material. It is possible, indeed, that the cultures of comma bacilli in sterilized bouillon under ordinary circumstances may be naturally weak.

Nothing could be easier, if it were necessary, than to attenuate them still further by heat, as the comma bacillus belongs to the class of pathogenic microbes whose activity is very easily modified by this agent.

6. The quantity of the virulent material inoculated should be regulated according to the activity of that material. It is possible that the liquid used by M. Ferrán is so little active that it is necessary to inject it in the dose of one cubic centimetre, but the evidence justifies the belief that the injections would be entirely as efficacious if they were made with only two or three drops of a fluid well prepared.

7. There is little chance of creating foci of infection by the practice of preventive anti-choleraic inoculations, because the inoculated subjects are not in a condition favorable to the production and dissemination of malignant germs.

8. Active scientific deductions therefore authorize tentative preventive inoculations in cholera by the injection of liquids containing cultures of the comma bacillus into the subcutaneous cellular tissue.

They explain the innocuity of these inoculations, but do not permit their *efficacy a priori* to be affirmed. For the latter rigorous, comparative experiments are necessary.

9. From the general results of this study, there is reason to follow with interest the inoculations of M. Ferrán, notwithstanding the unscientific character of his preceding researches and of his actual practice.

There is reason likewise to examine critically the results which he announces. —*Le Progrès Médical*, August 22, 1885.

The Comma Bacillus in the Organism; its Cultivation and Products of Fermentation.

Nicati and Rietsch, in the *Arch. de Physiologie*, vol. xvi. p. 72, make a report concerning the occurrence of the comma bacillus in cholera, and also of their observations at Marseilles concerning its morphological and biological peculiarities. After a description of the methods of microscopical examination pursued by them, which do not differ materially from those employed by Koch, they append the collected results of thirty-one post-mortem examinations.

They state, in the first place, that in every instance the presence of the comma bacillus was confirmed; but from further data and a tabular review it appears that in six instances only negative results were obtained. However, on account of insufficient examination of the bodies of the deceased, they place no value upon their conclusions. In one instance the bacilli were found in the stools of the patient, but could not be discovered in the body after death. The number of bacilli varied according to the course and duration of the disease. In rapid cases they appeared to diminish considerably from the fourth to the fifth day. In vomited matter they were discovered in three out of eight cases. The anatomical changes of the intestine were principally confined to the epithelium. This peeled off, and the inner layer of the bowel had the appearance of being strewn over with flour. Injection of the follicles and Peyer's patches, as well as infiltration of these glands, was observed later, but not as a constant appearance if the epithelium was entirely desquamated. Throughout the extent of the affected intestine the bacilli were found in abundance; in rapid cases they were found in the duodenum and throughout the whole smaller intestine. They were not present in the stomach. In the less rapid cases they were found only in the ileum, especially in the neighborhood of the ileo-cæcal valve.

In the moist chamber the bacilli increased so rapidly in the mucosa, that finally the tissue of the mucous membrane could no longer be seen. Furthermore, the bacilli were easily recognized in the bowel beneath the epithelium and in the connective tissue. They were sought without success in the liver. They were found, however, once in the ductus communis choledochus, and in two of five cases in the gall-bladder.

As control experiments, the intestines of three suicides and the stools of twelve diarrhœa patients were vainly searched for the comma bacillus.

These results the experimenters consider as entirely confirming the communications of Koch, with whom they also agree in their report concerning the gelatine and plate cultures, together with the appearance and growth of the colonies. In consequence of their agreement with the report of Koch, more extended reference to their account is unnecessary. In addition to their study of solid culture material, the investigators also cultivated the bacillus to obtain more exact information as to biological peculiarities in fluid media. Here they observed in all their cultures a peculiar but not unpleasant odor; neither was it a putrid odor, nor common to the contents of the bowel. This, they consider, had its origin in the alkaloid which Villiers has demonstrated to be present in the intestinal contents of cholera patients, and which has the odor of whitethorn.

The recognized morphological peculiarities of the bacillus are also pointed out. Special attention should be called to the fact that the spiral forms of greater circumference which, in consequence of their length, moved only slowly, were especially found in fluid culture media.

In conclusion, attention is called to the peculiarities of another curved bacillus whose microscopic appearance could easily cause it to be confounded with the comma bacillus.

This bacillus Nicati and Rietsch found in the intestine of a healthy man, and by culture it is easily distinguishable from the true comma bacillus.

The colonies differ considerably from those of the latter by a uniform radiate striation proceeding from a dark nucleus.

Morphologically, it is of plumper shape than the comma bacillus, and only slightly inclines to a spiral form. In the ground water of Lille, Hericourt has discovered still another curved bacillus. This Nicati and Rietsch consider identical with the one described by them, and also hold both to be identical with the bacillus of Finkler and Prior.—*Deutsche Medicinische Wochenschr.*, August 27, 1885.

Two Cases of Severe Anæmia cured by the Subcutaneous Injection of Blood.

Dr. OSCAR SILBERMANN reports, in the *Deutsch. Med. Wochenschrift* of June 25, 1885, two cases of severe anæmia cured by the subcutaneous injection of blood.

CASE I.—The first case is that of a boy eight years of age, who, after a severe attack of measles and whooping-cough, became exceedingly anæmic. The face was sallow and the mucous membranes pale. There existed also palpitation of the heart, fainting, vomiting, and a systolic mitral murmur. The patient was persistently drowsy, and sometimes slept almost the entire day. Slumber during the night was frequently disturbed by slight fever. Examination of the blood showed it to be very pale in color, and also to contain white corpuscles in a proportion far beyond the normal. March 1, 1885, subcutaneous injections of blood were administered, according to the method recommended by Ziemssen. After careful disinfection of the arms of both donor and patient, as well as of the hands of the operator and his instruments, forty-five grammes of blood were taken from the arm of a healthy brother of the patient, and received into a thoroughly disinfected basin, and defibrinated in a water-bath having a temperature of 102.2° F. Twenty grammes of blood were then injected into each thigh, by means of a warmed and thoroughly disinfected glass syringe. The operation only required sixteen minutes.

The condition of the patient in the evening was favorable. The temperature was normal, and there was no inflammation or pain at sites of injection.

Two days after the operation the condition of the patient was considerably improved. The complexion was more healthful. No fainting fits had occurred.

March 10, a syncopal attack having recurred the day previous, a second injection of forty grammes of blood was administered.

The procedure was as before painless and unaccompanied by adverse symptoms, and the progress of the patient toward recovery was uninterrupted.

The vomiting, palpitation of the heart, and attacks of fainting no longer were present, and May 20, less than three months after the inauguration of the treatment, the patient was nearly cured.

CASE II.—The second case reported by Dr. Silbermann is that of a girl eleven years old, who, in consequence of profuse hemorrhage from the removal of an intestinal polypus, became very much reduced and anæmic. As in the preceding case marked paleness of the skin and mucous membranes existed, together with attacks of syncope, vomiting, and gastric pain. Respiration was very feeble, and a systolic murmur was recognizable at the apex of the heart. The blood was pale, and the proportion of the white corpuscles greatly increased. February 26, subcutaneous injection of blood was practised with the same antiseptic precautions as in the preceding case.

The results agree in all respects with those observed in the first case. By the middle of March, in addition to the disappearance of the symptoms before enumerated, the weight of the child had increased nearly seven pounds, and at the present time her health is perfect.

Contribution to the Study of Morphiomania.

Dr. MARANDON DE MONTYEL summarizes the results of his investigations of the production of morphiomania as follows:—

I. Morphiomania has its origin either in a demand for intellectual excitation and psychical pleasure or in the acquired habit.

II. Injections of morphia have as a result a double action: a benign and a special action upon the nervous system by which its natural function becomes impossible after a certain term without the assistance of the poison. These two effects are separate and distinct from each other; the second is manifested when the first is no longer exhibited. There are, then, two kinds of morphiomania; the one resulting in temporary good effect, the other a vital necessity; and after a variable period the cases of the first order pass over into the second.

III. This double action of morphia upon the nervous system renders it an extremely dangerous medicament, and it therefore should not be prescribed hypodermically except in cases of absolute necessity.

IV. It is also extremely dangerous to combat morphiomania by the substitution of alcoholics, inasmuch as chronic alcoholic insanity may result therefrom.

V. Morphiomania may always be treated by abrupt withdrawal of the drug except in conditions when such methods are contraindicated by the vital forces of the patient or concomitant pathological phenomena. The method should also be abandoned if reactionary collapse result.

VI. In the treatment of morphiomania by gradual suppression of the drug, it appears advantageous to combine with the progressive diminution of the dose the recoil of momentum by fusing two injections into one.

VII. The medico-legal questions pertaining to morphiomania are certainly based more upon extra-judicial than upon judicial clinical observation.

VIII. Observation shows that a morphiomaniac may have great energy of will while the poison has not yet determined any disorder of intellect. There is here a serious proof of what has already been said, that responsibility only ceases with the period of psycho-physical marasmus.

IX. Relative to the responsibility of morphiomaniacs who commit crimes or offenses to satisfy their passion, it is, perhaps, necessary to distinguish whether they have yielded to the simple appetite for the pleasant effect or to a physical necessity dependent upon the instinct of self-preservation. A conclusion of irresponsibility in the latter case seems justified.

X. In the exact appreciation of the intellectual troubles caused by the abuse of the hypodermatic injection of morphia, it is important correctly to appreciate the existence of predisposition to insanity, and the delirium produced concurrently by the absorption of other substances such as alcohol and belladonna.

XI. It is necessary to retard the continual progress of morphiomania by disseminating general information in the upper ranks of society concerning the deplorable and certain evil effects following the use of the drug, and to exercise an active surveillance over pharmacists, and impose special penalties upon those who dispense morphia without a physician's prescription.—*L'Encéphale*, May and June, 1885.

Case of Tubercular Meningitis subsequent to Lupus. Tubercle Bacilli in the Blood.

DOUTRELEPONT, in the *Deutsche Med. Wochenschrift*, No. 7, 1885, reports the case of a girl eighteen years of age who was affected with lupus in various parts of the face, and with scrofuloderm, especially of the neck. In some portions of the skin affected with lupus and in the granulations of the scrofuloderm, tubercle bacilli were found. Treatment by erasion and corrosive applications together with the internal use of arsenic and iron resulted in the cure of the patient, and the disappearance of discoloration of the skin.

Shortly, however, the patient was seized with violent pain in the breast, headache, and violent vomiting. Blood taken with great care from the sound skin of the cheek contained tubercle bacilli. Death occurred in a short time, and post-mortem examination showed the pia mater at the base of the brain to be filled with miliary tubercle. The lower lobes of both lungs contained yellowish-gray granules and aggregations of tubercular material, while tubercular nodes were also present in the ileum. Blood taken from the internal jugular veins and the heart contained tubercle bacilli.

From the appearances presented Doutrelepont concludes that the general infection resulted from the initial tubercular lesion in the skin.—*Centralblatt für die Med. Wissenschaften*, August 1, 1885.

A Case of Paralysis and Suture of the Radial Nerve.

Dr. E. HOFFMANN reports the case of a man, aged 31, in whom fracture of the humerus in its middle third occurred as the result of a fall.

A plaster bandage after remaining three days was replaced by one of soft material (muslin), and in six weeks, on removal of the dressing, firm union had taken place, while complete paralysis was observed along the entire course of the radial nerve.

Immediate treatment by electricity was without result, and three months subsequent to the injury the patient was operated on by Bardenheuer.

The continuity of the nerve was found broken at the seat of fracture, and surrounded by a thick mass of callus.

The callus was removed and the nerve sutured, and electricity regularly applied for three months when the patient was discharged uncured.

The patient finally came under Dr. Hoffmann's attention, still suffering with complete left radial paralysis. The hand and finger were in a position of strong volar flexion, out of which they could be brought only by the application of considerable force.

No voluntary motion of the muscles of the forearm supplied by the radial nerve was possible, and stimulation with the induced current also was without result, the same being true of weak galvanic currents. Strong primary currents, however, excited slight motion, especially in the carpal extensors, and since the cathodal closing current produced greater contraction than the anodal closing, the prognosis was not considered hopeless. The patient was persuaded to persevere in electrical treatment for six months.

A splint was applied to the arm by which the hand and finger were held in dorsal flexion in order to extend the volar bands and the tendons. Systematic application of the galvanic current was also made, with the result that in eight weeks the Faradic current was able to produce contraction of the paralyzed muscles.

In three months voluntary motion was possible for the first time, when the forearm was held perpendicular to the arm ; partial dorsal flexion of the hand was also possible.

Within a year after the reception of the injury, the function of the hand and muscles was entirely restored, save voluntary motion of the extensors and long abductor of the thumb, but the electrical contraction of these is such that there is no doubt that ultimately the complete usefulness of the hand will be restored.

Dr. Hoffmann also refers incidentally to other recorded cases of nerve-suture in Friedlander's *Fortschritte der Medicin.—Deutsche Med. Wochenschr.*, July 2, 1885.

Pseudo-Syphilitic Paralysis.

M. Ferdinand Dreyfous, in concluding an able paper upon pseudo-syphilitic paralysis, which he designates as "Parrot's disease," gives the following points in reference to the diagnosis of the disease :—

1. *The age of the patient.* Pseudo-syphilitic paralysis always appears during the first month after birth.

2. *Pains.* This symptom is difficult to establish, and the crying of the child when examination is made is its only index.

3. *The persistence of certain movements.* In contrast with true paralysis in the pseudo-paralysis of syphilis, certain movements of the fingers are possible, although their combined motion is impossible.

4. *The swelling of a bony epiphysis.* This symptom, if the swelling is extensive, is easily recognizable, but may be scarcely appreciable, and escape attention even when paretic phenomena are well established.

5. *The progress of the paralysis.* Paralysis in the beginning is not general, but attacks first one member, then its fellow, and subsequently the two others symmetrically.

6. *The general condition of the patient.* Syphilitic children, affected with pseudo-paralysis, are generally cachectic, as a result of the disease. No fever is present. The temperature is more probably subnormal than elevated.

7. *Inquiry concerning the antecedents, and the present condition of the parents.* Examination of the mother should be made, provided that of the child

is negative, and inquiry made concerning miscarriages, the mortality of children born at term, etc. The history of the father should also be examined.—*Revue de Médecine*, August, 1885.

Periodic Paralysis of the Limbs, with Loss of Electric Excitability.

A remarkable case of periodical paralysis is recorded in a paper by Professor WESTPHAL, *Berliner Klinische Wochenschrift*, Nos. 31 and 32, 1885. The patient, a boy of 12 years, was under close observation for several months, during which he was subject to occasional attacks of absolute loss of power in the limbs, coming on almost always at night, lasting for a few hours and disappearing with a period of quiet sleep before the morning. His general health was good, and no signs of nervous disease could be traced in the case. During the periods of paralysis, however, the remarkable fact was observed that the nerve-trunks and the individual muscles in the affected limbs had completely lost their electric excitability even under the irritation of a very strong current. At other times, the reactions were quite normal, but slight differences between the two sides persisted for some time after the complete return of voluntary movement. There was no sign of rigidity or contraction in any of the muscles during the attacks, nor were the general sensations disturbed. The plantar reflex was absent, but the cremaster and abdominal reflexes and the knee-jerk were normal. The latter was at times unequal upon the two sides. The fullest particulars of each seizure are given in detail in Dr. Westphal's paper. The progress of the paralysis of the limbs could be clearly described by the patient, who remained quite sensible throughout. In the early history of the case, there was reason to believe that scarlatinal nephritis had formerly been present, but the renal and all other functions remained normal throughout the period during which the patient was under observation. The onset of the attacks was attributed to exposure to a draught, the boy having complained the day before of indefinite sensations in the limbs, and pains in the feet. He became quite powerless in the following night, and suffered from great thirst, a feeling of extreme heat, and profuse sweating. At first the attacks of paralysis recurred at intervals of four to six weeks, but became more frequent, at last sometimes appearing many times in one week.

In his remarks upon the case, Professor Westphal cites three other published cases as bearing some relation to this apparently unique form of paralysis. In all of them there were points of resemblance to it, although none could be said to be identical. Especially with regard to the periods of recurrence, there was a marked difference, as in two of them the attacks followed a regular quotidian or tertian course. In all the cases the paralysis began in the lower extremities. The muscles of the face and of the eye remained unaffected in all, nor was any affection of bladder or rectum observed. The loss of electric contractility and its rapid recovery are conditions apparently quite peculiar to Westphal's case. In relation to it he says: "We know of no disease either of the spinal cord or of the spinal nerves in which anything similar to it has ever before been observed, and as regards any explanation of it, physiology leaves us completely in the dark." The sensations of heat and the extreme sweating experienced by the patient suggest the possibility of some profound alteration of the vascular supply, and hence of the nutrition of peripheral nerve-endings, but such an explanation is of necessity purely conjectural.—*The Medical Times*, August 29, 1885.

Suppurative Epiglottitis, complicated with Œdema of the Glottis, and followed by Death from Asphyxia.

Dr. FREDET reports the case of a young man, who, after drinking and singing a great deal, became involved in a quarrel and was severely choked. Near midnight he left the inn where the quarrel occurred, very warm, while the night was damp and cold, to go to his home. While on the road he experienced considerable difficulty in respiration, and said to his friends that he attributed his trouble to the pressure made upon his neck by his assailant. Disturbance of respiration became more intense, and the suffocative attacks so much increased in violence that it became necessary to carry the patient home, where he died an hour and a half after his departure from the inn. The rapid death and the charges made by the deceased previous to his death rendered it probable that the injury received was cause of death, and the assailant was arrested. Post-mortem examination showed the following conditions: The neck was enlarged and presented a circumference greater than normal; the swelling of the neck was not caused by enlargement of the thyroid body, and there was no ecchymosis or wound, as a result of pressure from the fingers. Incision showed that the vessels of the neck were partly dilated, and a very great quantity of blood flowed from the thyroid vessels, which were tense and congested. The whole respiratory apparatus having been removed, the following lesions were noted:—

1. Œdema of the uvula, which was as large as a small walnut.
2. Œdema of the epiglottis, which was the shape of a large cork; and the same condition was manifest in the aryteno-epiglottic folds and intra-ventricular space.
3. Contraction of the orifice of the glottis, evidently caused by the excessive hypertrophy of the epiglottis.
4. Finally, on incising the superior face of the epiglottis, pus in volume equal to a small walnut escaped.
5. The cartilages were neither fractured nor necrosed.

A frothy and sanguinolent fluid occupied the trachea and the calibre of the greater bronchi; the lungs were hyperæmic and livid; the cavities of the heart were filled with clots; and the patient had died from mechanical asphyxia—sufficiently explained by the lesions above enumerated.

On consulting the relations of the deceased, it was learned that he smoked and drank to excess, and had had the *voix enrouée*, and accordingly was afflicted with alcoholic laryngitis. The inflammation of the various portions of the larynx was therefore not recent, and the œdema of the tissues, if not the abscess revealed by the autopsy, dated back many weeks, and possibly months. The inflammation was increased by the singing, shouting, and quarrelling, and the sudden passage from an overheated room into the cold and damp atmosphere of the street explained the increase of œdema. The prisoner consequently was released, all the circumstances failing to justify placing the responsibility for the death of the patient upon the choking done by him.—*L' Union Médicale*, June 25, 1885.

Irrigation of the Stomach in Ileus.

Delprat, in *Nederl. Tijdschr. vor Geneeskunde*, 1885, No. 13, reports two cases of ileus treated by irrigation of the stomach, in the clinic of Professor Pel. The first, a young man aged twenty-eight, had for some time difficulty in defecation, with its final failure, which, when he was first seen, had persisted for four days. Pulse was small and frequent. Persistent hiccough. Movement of the distended intestine was perceptible through the abdominal wall, and vomiting of thin fluid fecal matter was present.

Treatment for two days with opium and enemata was without effect.

Irrigation was then tried and gave immediate relief, the distension of belly at once diminishing, and the vomiting and hiccough ceasing. During three successive days irrigation was practised seven times. The fourth day, no movement of the bowels having occurred, and the belly being still distended, and the pulse having become smaller and more frequent, laparotomy was performed in the right mesogastric region. No cause of constriction was found, but the inflated intestine was sutured in the abdominal wound and opened. The night succeeding the operation flatus and liquid feces passed per rectum, and on the third day there was a copious alvine discharge. The patient recovered.

The second case was a woman aged thirty-seven years, who for some time had been treated for pain in the stomach and very difficult defecation, for which enemata were given. After the patient had been treated two weeks symptoms of intestinal occlusion supervened, and a few days later stercoraceous vomiting took place.

During three days, in which abdominal irrigation was made, there was cessation of the stercoraceous vomiting, but neither flatus nor defecation was present.

Soon after the use of the stomach-syphon a tumor made its appearance in the ileo-cæcal region.

Laparotomy was performed by Professor Tilanus, and the tumor was found almost entirely to occlude the lumen of the intestine. Resection of the cæcum and small intestine was performed, and was followed on the fifth day by death from perforating peritonitis.

Delprat concludes the report with the remark that, since improvement in each case took place from the irrigation, it should in all cases of ileus be a first resort, and further remarks that where this measure fails laparotomy may still afford means of relief.—*Centralbl. für Chirurgie*, August 1, 1885.

The Physiology of Hepatic Colic.

N. P. SIMANOWSKY (*Zeit. Klin. Med.*, Band V.), with the aim to elucidate the physiology of hepatic colic, has recently undertaken a series of experiments upon dogs.

He first established a biliary fistula and afterward submitted the gall-bladder to different forms of irritation. As a result of his experiments, the following conclusions were reached:—

1. The introduction of electrodes or of any other foreign body into the gall-bladder produces violent pain.
2. When the electrodes are introduced or withdrawn, pain, similar to that caused by spasmodic contracture of the walls of the gall-bladder, is produced.
3. The pulsations of the heart are increased in frequency under the influence of feeble electric currents. They are diminished by strong currents and the cardiac rhythm is disturbed.
4. When the electrical stimulation is maintained for a considerable period, the cardiac actively diminishes. Under the same conditions the same effect is observed with feeble currents.
5. Electrical excitation increases the frequency of respiration (twenty to seventy respirations per minute). Strong excitation causes a momentary arrest of respirations.
6. The rectal temperature is elevated during excitation. There is no relation between this effect and violent movements on the part of the animal.
7. The temperature of the skin taken at symmetrical points of the body presents great variation under such excitation of the gall-bladder, being frequently elevated on one side and depressed on the other.
8. At the termination of such experiments, paresis of the posterior limbs was not infrequently observed. In some cases this condition persisted for several months.
9. Excitation of the gall-bladder frequently produced vomiting.
10. Excitation always produced increased blood-pressure, provided that the vagus had not been previously divided in the neck.—*Revue des Sciences Médicales*, July 1, 1885.

Lymphoderma Perniciosa.

Under this title Professor **Kaposi**, of Vienna, has lately described in detail a case of what he believes to be a hitherto undescribed form of skin disease. A widow, æt. 39, had suffered for more than a year from an eruption, which passed at first for universal chronic eczema. On admission to the hospital the face and hands were chiefly affected, but the skin of the scalp, forehead, face, ears, and neck was of a diffuse brownish-red color, thickened, desquamating, and with honey-like crusts here and there. In the clavicular regions, upper part of chest, and axillæ, the submammary folds were reddened more or less, and desquamating or oozing. On the abdomen and back were similar patches. The extensor aspect of the upper limbs was the seat of a certain degree of desquamation, and the skin of the wrists and hands was thickened, scaly, cracked, and oozing in places, whilst the inferior extremities were less affected. The inguinal and cervical glands were swollen to the size of nuts, and firm. No visceral disease was detected, and the temperature was normal, but violent itching accompanied the eruption. On the left thenar eminence and the flexor aspect of the forearms were to be felt in the subcutaneous tissue several firm nodules, in size from a pea to a pigeon's egg, fairly well circumscribed. From her admission till six months later, when the woman suddenly died after an acute paralysis of the left inferior extremity the day before, the nodosities steadily increased in number in the deep cutaneous and the subcutaneous tissue of the flexor aspect of the forearms, breasts, epigastrium, abdomen, face, etc. They softened and ulcerated through and became covered with crusts. The face became enormously swollen and leontiastic, and the ears stood out from the head. The spleen soon became enlarged, and a serous infiltration of the skin set in with ascites. The lymphatic glands became involved, and a progressive diminution of red blood-corpuscles was traced. At the necropsy the spleen was four times its normal size, the liver voluminous; some small nodosities were found in the lungs and beneath the pleura, and the medulla of the bones seems to have been affected. The skin and lung tumors were all of the same character, and the former apparently originated near fat lobules. They were composed of a delicate fibrillar stroma, deprived of vessels, with connective-tissue corpuscles poor in protoplasm in places where cells, resembling lymph-cells, and lymphoid nuclei occurred aggregated in extremely dense masses free in the intercellular spaces.

Professor Kaposi refers shortly to cases described as *lymphadenie cutanée* by French authors, which have been described, if we remember rightly, as preceded by eczema, but he refuses to acknowledge the identity of the affections.—*The Lancet*, August 29, 1885.

Treatment of Tape-Worms.

Dr. **Bérenger Féraud** concludes a long series of investigations upon the treatment of tape-worm, with the following estimate of the comparative value of the therapeutic agents generally employed for their removal. He says: Among the remedies employed by marine physicians, calomel, sea-salt, garlic, bark of the mulberry-tree, and eucalyptus do not appear to possess any value; turpentine and *noix de coco* are too rarely beneficial ordinarily to warrant their employment.

Fern, as a remedy, merits further study, in order that its real value may be determined.

Pumpkin-seed possesses only a slight therapeutic value, though it sometimes brings about the complete expulsion of the worm.

Kousso, entirely fresh, is an excellent tænifuge, but rapidly deteriorates with age, and is thus rendered inert.

Pomegranate is, in our present state of knowledge, the tænifuge *par excellence.* The bark, obtained from a tree sufficiently young and in active growth, produces the best results. However, as it is demonstrated that the good results obtained from the use of the pomegranate-bark are due to the pelletierine contained therein, and that this principle varies with the age and condition of the bark and with the part of the tree from which it is obtained, the pelletierine is to be preferred to the bark, just as quinine is to be preferred to the crude bark of which it is an alkaloid; and furthermore, the exact dose of pelletierine can be precisely determined, a result not always possible to be attained with the pomegranate bark.

In order to obtain the complete effects of pelletierine, it is necessary to employ it according to determined rules and with certain precautions, of which the following are the principal:—

When the diagnosis of the presence of a tape-worm is established, inquiries should at once be made as to the ease with which the patient is purged. The evening of the day previous to that on which it is determined to attempt the expulsion of the tape-worm, the patient should be put upon milk diet, pure milk, bread and milk, rice and milk, eggs and milk, egg custard, or cream; and all other food prohibited, in order to have the digestive tract entirely free from all substances which can in any way destroy the efficiency of the drug. The day on which the attempt to expel the worm is to be made, the patient should remain in bed, and at 6 A. M. receive an infusion of senna, containing from 2½ to 4 drachms of the leaves in about 3 ounces of water sweetened with an aromatic syrup. At 7½ A. M., the patient will receive one-half the prescribed quantity of pelletierine, the full dose being 6 grains of the tannate. Immediately after receiving the first portion of the tænifuge the patient should recline with closed eyes, and as far as possible remain perfectly quiet, to escape nausea and vomiting. At 8 A. M., one-half hour after the first dose of pelletierine, the second portion is to be administered, and if no nausea has been experienced by the patient, it is to be followed immediately by the purgative already referred to. If, on the contrary, nausea exists, the administration of the purgative may be deferred from fifteen to thirty minutes, but *no* longer. The dose of the purgative is graduated according to the facility with which the patient is affected thereby. After its reception the reclining position is to be maintained as before advised. When the drug is beginning to act, as is evidenced in increased intestinal peristalsis, the desire to go to stool is to be withstood as long as possible. If, on the contrary, the purgative does not seem to be sufficiently prompt in its action, a purgative enema should be administered, containing 2½ drachms of senna leaves and 10 drachms of soda sulph. This injection should indeed be administered in all cases when the desire to go to stool is first experienced, inasmuch as it distends the intestine and thus renders the expulsion of the parasite more easy. In some cases Dr. Féraud introduces infusion of pomegranate-bark, about 1 ounce boiled in 6½ ounces of water till reduced to about 5 ounces, to which are added 10 drachms of soda sulph. in water sufficient to make the whole mixture equal to 6½ ounces. The effect obtained is to bathe the parasite already stupefied in the decoction of pomegranate, and the procedure is recommended as being generally advisable when the patient goes to stool. The vessel used should be of ample size and half filled with warm water, so that if the worm is not expelled entire, the part first escaping will be sustained by the water and thus be less in danger of breaking. After the first stool, examination should be made to discover whether the parasite has passed entire or remains partly within and partly without the rectum. If it has apparently passed entire, search should be made for the head.

If the worm remain partially within and partially without the anus, no attempt should be made to pull it away from the rectum, but injections should be carefully made until they have the effect of dislodging it. Too much stress cannot be laid upon the importance of refraining from all attempts to remove it by traction. If the removal of the worm has not been accomplished, large doses of mineral purgatives are at once to be administered in order to obtain further purgation as quickly as possible. In this treatment of tape-worm it may be put down as an axiom, that if purgation is slow or insufficient there is very great risk of failure.

The impediments to success in this method of treatment may be:—

(A) *Vomiting.*

(B) *Insufficiency of purgation.*

(A) Should vomiting occur as a result of the administration of the pelletierine, a second dose should be given in an amount regulated according to the time the first dose was retained. If vomited a quarter of an hour after its injection, it should be estimated that one-fourth of the drug was absorbed, and if after a half hour that it was one-half absorbed, and so on. The degree of nervous excitement produced by the first dose should always serve to indicate whether an entire or partial dose should be subsequently administered. In no case should a third dose be given.

(B) Insufficiency of purgation should be remedied as above indicated.—*Bulletin Général de Thérapeutique*, May 30, 1885.

SURGERY.

Indications for the Extirpation of Goître.

Dr. Josef Rotter, in a paper on the operative treatment of goître (*Archiv für Klin. Chirurg.*, Band XXXI., Heft IV.), points out that, before the surgeon performs extirpation of the thyroid body, it is desirable that he obtain some precise and reliable indications for a procedure so difficult and dangerous. The views of surgeons on the indications, whilst agreeing in general outline, still differ on several not unimportant points. Those who have been fortunate in their experience of this operation believe it to be almost quite free from danger, whilst those who have had less success are apt to over-estimate its dangers. More than 600 cases of removal of the thyroid gland have now been recorded; and during the last three years the mortality, it is asserted, has been about 10 per cent. Although some operators have had a much lower rate of mortality, and death from the operation might possibly have been avoided in some of the fatal cases, still removal of the thyroid body cannot be regarded as a procedure that is free from danger. Unexpected and serious complications are liable to occur in any instance, and the surgeon cannot estimate the probabilities of success so closely in this operation as, for instance, in amputation of the thigh. Still, though the difficulties and dangers of the operation cannot well be over-estimated, the surgeon must take into consideration the fact that the subject of goître is exposed to many serious dangers, particularly that of very sudden and alarming attacks of dyspnœa.

Dr. Rotter holds that it is the duty of the surgeon to undertake extirpation of the enlarged thyroid body under any of the following circumstances: If the tumor have caused any attacks of extreme dyspnœa, this is a clear indication for the performance of the operation. It should be undertaken also if the goître have caused such disturbance of breathing as to render the patient incapable of attempting any active bodily exertion. If, in a case of rapidly enlarging goître, the iodine treatment have failed, and the disturbances caused by the tumor have not been thus relieved, the surgeon should, without waiting for any attack of severe dyspnœa, strongly urge an early operation. In case of large goître of long standing, alterations of the trachea are likely to take place, which may place the patient's life in danger before the operation, and afterwards may complicate the healing process. A fourth indication is presented by serious difficulty in deglutition. Finally, there are cases in which the operation, though it cannot cure the patient, may relieve him of some condition that renders life intolerable; such, for instance, as those of an incurable thyroid fistula and of a goître which, by its great size, prevents the patient from pursuing his occupation.

The existence of a suffocating goître is naturally no contraindication, but rather an absolute indication for extirpation. On the other hand, under the remaining circumstances, the surgeon should hold his hand when the patient presents an unfavorable general condition which cannot be attributed to the disease of the thyroid body. In the case of any associated morbid condition which is clearly due to the presence of the goître, this restriction is not to be observed. A calcified and fixed goître should not be interfered with, except in the presence of some pressing indication. Recent improvements in operative methods have rendered possible the extirpation of very large and broadly based goîtres.

In the opinion of Wölfler and Higguet, extirpation of the thyroid should not be performed on patients above the age of 60. Liebrecht, however, reports that the three oldest patients on whom he operated, and who were between 60 and 70 years of age, all recovered. In the tables collected by the author of cases under Professor Maas and others, it is shown that of twelve persons above the age of 60 on whom strumectomy was performed three died, but the fatal result was due in one case to septic poisoning, and in another to hemorrhage, causes which certainly are not peculiar to old age. The third patient died from pneumonia on the twenty-first day from that of the operation. Advanced age, therefore, cannot be regarded as a contraindication of the operation. Liebrecht advises that the operation should not be performed on any subject with extreme atheroma of the vessels. Dr. Rotter, however, alludes to a case in which, though the patient was affected with this condition in a high degree, the operation was not followed by hemorrhage or any other complication.

In considering when it is necessary to perform total and when only partial extirpation of the thyroid body, Dr Rotter states that the minor operation should be applied to those cases in which but one lobe is enlarged, and this affected lobe is connected with a healthy portion of the gland by a thin and narrow pedicle. In regions where goître is endemic the extirpation should always be total, in order that relapse may be prevented. It has been proved by the tables of Wöldler and Liebrecht, that partial is not less dangerous than total removal. Dr. Rotter does not share the view of Kocher and Reverdin with regard to the so-called cachexia strumipriva as a special danger after total removal. The symptoms of this cachexia, it is held, are marked by the unmistakable impress of cretinism. This condition of cachexia, according to H. Bircher, occurs as a consequence, not of absence of the thyroid body, but of a chronic general condition, which causes in its first stage the development of goître, and, in its second stage, symptoms of cretinism. The subjects of excision of the thyroid body become cretins, not because the gland has been extirpated, but because they remain in districts where goître is endemic, and expose themselves to further infection. Rotter also takes this view, and therefore does not regard the so-called cachexia strumipriva as a contraindication of total extirpation of goître.—*London Medical Record*, July 15, 1885.

Diaphragmatic Hernia in an Adult.

M. A. Cayla, at a meeting of the Société Anatomique, held November 21, 1884, presented specimens taking from an adult patient in whom existed a diaphragmatic hernia.

The man was thirty-two years of age, of good constitution, and a worker in lead, but showed no symptoms of lead poisoning.

On being admitted to the Hôpital Dieu he related that five days previously he was seized, while lifting a heavy piece of metal, with a violent pain in the left lower side of his chest. Notwithstanding the pain he continued work, and even ate his dinner, without discomfort. Two hours subsequently, however, he was seized with violent vomiting accompanied with great pain in the epigastrium.

The patient further stated that six years previously he was suddenly seized with vomiting and constipation, and that these symptoms had been regarded as the result of lead poisoning.

Examination now made failed to discover the cause of the symptoms. Palpation gave no evidence of internal obstruction, and hernia did not exist.

The belly was retracted, and painful to pressure in the epigastrium. The condition of the patient gradually grew worse, and he died in collapse three days after admission to the hospital.

Post-mortem examination. The small portion of the abdominal cavity occupied by intestines first attracted attention. The liver occupied the entire epigastric depression. The stomach was not visible, and on raising the liver it was still undiscoverable. The greater omentum was massed below the inferior border of the liver, and beneath the diaphragm was found an omental mass which concealed a hernia of this organ, through which the stomach had passed into the thoracic cavity.

Examination made of the thorax revealed the following conditions:—

The entire stomach, much dilated, and almost filled with liquid, occupied the left thoracic cavity, the lung of which side being crowded into the upper portion of the thoracic cavity.

The cardia and pylorus were situated in the abdomen. At the level of the hernial orifice the stomach was twisted upon its axis, so that a finger with difficulty could be introduced into the ring, and the hernia reduced.

The stomach at the seat of the stricture was of a darkish-red color, and upon its greater curvature there was a loss of mucus and muscular tissue, together with small superficial erosions. The œsophagus was not dilated. The orifice in the diaphragm was circular, and situated in the fleshy portion of the muscle between its left and middle leaves.

The peritoneum seemed to be directly continuous with the pleura, and no envelope of the stomach constituting a hernial sac was present.—*Le Progrès Médical*, August 8, 1885.

Splenotomy in Leukæmia.

Biziel, in *Przeglad lekarski*, 1885, No. 14, records the following case of splenotomy in leukæmia, in which the operation was performed by Dr. Rydygier. The patient, a woman aged thirty-one years, had noticed for two years a tumor in the right hypochondrium. The swelling rapidly increased, and, through its size, occasioned considerable annoyance. Examination showed the existence of pronounced leukæmia. In view of the great risks incurred in splenotomy the patient was persuaded to postpone the desired operation. At the end of ten months the patient returned, insisting upon removal of the organ because the pain caused by the tumor had constantly increased, and was no longer endurable. The spleen was now more than twenty inches long, hard, and slightly movable; and the proportion of white blood-corpuscles was considerably increased. The condition of the patient was such that she was unable to walk or stand, and during the last months she was compelled to keep her bed. Dr. Rydygier now consented to operate, and on October 3, 1884, performed splenotomy.

The abdominal wound bled more profusely than is common. The spleen was removed with comparatively little difficulty. The pedicle was tied with elastic and silk ligatures, and in order to prevent the slipping of the ligatures a small portion of the spleen was left at the hylus. The abdominal wound was closed and corrosive dressing applied. The temperature rose on the day of the operation to 103.1° Fahr., and the pulse was weak and 136. On the following day the temperature fell to 101.3° Fahr. and the pulse to 120.

The patient died from weakness twenty-four hours after the operation. Death resulted from the hemorrhage from the abdominal incision which was caused by the defective coagulation of the leukæmic blood. The ligature of the pedicle was firm. Of 20 splenotomies performed in leukæmia only 1 (operated on by Franzolini, and not certainly a leukæmic tumor) recovered, and Dr. Biziel justly concludes that oprative interference in tumor of the spleen of leukæmic origin is not indicated.—*Centralbl. für Chirurgie*, July 18, 1885.

The Pathogenesis of Umbilical Fistulæ.

J. CASTEL (*Thèse de Paris*, No. 56) classifies umbilical fistulæ, according to their origin, under the following heads:—

1. Fistulæ consecutive to an inflammatory process of an acute nature, such as suppurating peritonitis determining an abscess at the level of the umbilicus, puerperal peritonitis, the idiopathic peritonitis of infancy (Gauderon), and perforating peritonitis of Féréol.

2. Fistulæ consecutive to chronic phlegmasia of the peritoneum, *i. e.*, tubercular peritonitis, hydatid cysts, etc.

3. Entero-umbilical fistulæ (hernial, or diverticular, or fistulæ resulting from the presence of foreign bodies, or entozoa).

4. Umbilical fistulæ of hepatic origin (*i. e.*, caused by biliary calculi, hydatid cysts, or abscess of the liver).

5. Urinary fistulæ consecutive to persistent permeability of the urachus, some forms of which are congenital, and owing to which the patient may or may not be prevented from voiding his urine by the natural channel through a defect in the conformation of the parts, while others occur in the adult at a greater or less interval after birth, as a result of permeability of the urachus, and a consequent obstacle to the course of the urine.—*Revue des Sciences Médicales*, July, 1885.

Laparotomy in Cases of Perforative Peritonitis.

Prof. M. OBERST, of Halle, in a paper on a case of perforative peritonitis treated by laparotomy (*Centralbl. für Chirurg.*, No. 20, 1885), states, with regard to the operative treatment of acute septic peritonitis, that a favorable result from incision, antiseptic cleansing, and drainage can be expected only in cases in which either the infective focus has been localized through adhesive inflammation, and a more or less circumscribed abscess has been formed, or when, with diffuse peritonitis, operative treatment has been applied early, and before the formation of extensive adhesions between the coils of intestine. In most cases, however, of acute septic peritonitis, it is difficult to make out whether the inflammation be diffused or circumscribed, and in the latter case there would be a risk, in the performance of laparotomy, of breaking down the adhesions by which the infective material is confined. In acute peritonitis, due to intestinal perforation, the diagnosis is not, as a rule, attended with any special difficulty. Acute peritonitis sets in with unmistakable symptoms, and experience teaches that, with treatment of an expectant character, or applied simply to symptoms, death almost invariably ensues, as a result of diffused inflammation of the serous membrane. It is thought that, by performing an early laparotomy in cases of this kind, and by washing out the peritoneal cavity, and closing the wound in the intestine, many a life that would otherwise be surely doomed might be saved. A successful instance of such treatment has been recorded by Mikulicz. The patient was a man, aged 40, who, during a rapid movement, was seized with pain in the abdomen, and very soon afterwards presented symptoms of ileus and peritonitis. Seventy-two hours after the occurrence of the first symptoms, Mikulicz performed laparotomy, and found in the abdominal cavity nearly two pints of fetid pus, and some undigested pieces of potato. A perforation, about six centimetres in length and four centimetres in breadth, was found in the ileum. The margins of this were cut away, and the opening then closed by a dozen silken sutures. The peritoneal cavity was carefully cleansed, and the external wound closed by sutures. The perforation in this case had occurred, Mikulicz thinks, at the seat of a typhoid ulcer.

The case recorded by Professor Oberst is one which commenced in strangulation of an old scrotal hernia. The patient, aged 48 years, was admitted into the hospital at Halle on the fourth day, and then was much collapsed, and presented symptoms of intense peritonitis. Herniotomy was at once performed, but it was found that the sac, which was much distended by turbid and fetid fluid, did not contain any intestine. On opening the abdominal cavity by an incision which reached as far as the umbilicus, a considerable quantity of purulent fluid was set free; and the intestines were found much distended, and covered by a thick deposit of recent inflammatory lymph, by which adjacent coils were glued together. After a prolonged search a small orifice, from which exuded fecal fluid, was found in a loop of intestine deeply secluded in the abdominal cavity. The intestine was completely divided at the seat of this lesion, and the two ends fixed by sutures to the margins of the external wound to form an artificial anus. The cavity was then washed out with a warm solution of salicylic acid, and the inflammatory deposit scraped away from the surface of the intestines. After several drainage-tubes had been inserted into the peritoneal cavity, the external wound was closed by sutures. The patient rapidly recovered from the collapse, and during the first two weeks after the operation progressed favorably. Subsequently he became very weak, and in the ninth week died from extreme exhaustion, the fatal result having been accelerated by hypostatic pneumonia and the effects of decubitus.—*London Medical Record*, Aug. 15, 1885.

Successful Case of Laparotomy for Intestinal Obstruction.

Dr. Joseph B. Heald reports a case of successful operation in a man twenty-five years old, for intestinal obstruction, apparently resulting from a severe fall. After the accident, constipation occurring, the patient without advice took Epsom salts to relieve the condition, with the result of producing great discomfort and pain, though at the same time causing a slight movement of the bowels. Three compound cathartic pills taken later failed to produce any result whatever. Three days after the accident Dr. Heald was called to see the patient, who, failing to be relieved by large enemata of water and hypodermatic injections of atropia and morphia, consented to operation as affording the only prospect of recovery. The operation was performed by Dr. John C. Irish as follows :—

The patient being under ether the abdomen was opened in the median line by an incision seven inches long, reaching from the umbilicus to the pubes. Owing to the tense condition of the recti muscles, the incision was extended an inch above the umbilicus, and the left rectus muscle was divided at the left of the umbilicus.

We could learn nothing from inspection with the bowels *in situ*, on account of the extreme distension of the intestines from accumulated gas; nor could anything be ascertained by sense of touch with the hand in the abdominal cavity. Therefore the intestines were rapidly but carefully drawn out until about fifteen feet of them lay upon the abdomen, when sharp resistance was felt and the increased congestion of the intestines showed the constriction was reached. Dr. Irish then passed his hand into the abdominal cavity and withdrew the invaginated portion and relieved the obstruction.

At the location of the intussusception, which was ileo-cæcal, the bowel was intensely congested and somewhat darkened in hue. The invaginated portion, about three inches in length, was thickly studded with deposits of lymph. The congestion extended up the ileum only a few inches above the obstruction. The remainder of the small intestine appeared to be free from any inflammatory action. It was, however, greatly distended with gas, and in the lower portion of the ileum near the site of the invagination the distension had become very great. The colon was free from congestion and flaccid.

Up to this time the bowels outside the abdomen had lain perfectly quiet and dormant; but when the constriction was relieved, there was a sudden rush of gas, and the peristaltic action of the intestines started up, and gas escaped from the anus together with a large, thin, feculent discharge. The intestines were replaced with comparative ease, and the incision closed with silk sutures and adhesive straps. There was profound shock during the manipulation of the bowels, though the time of exposure was not more than five minutes. Our hands were washed in a five per cent. solution of carbolic acid, and the instruments and sponges were immersed in a solution of the same strength. The wound healed throughout by primary union. Stitches were removed on eighth and ninth days, and patient sat up on fourteenth day.

On the third day after the operation only did the temperature of the patient exceed 100° degrees F., at that time reaching 101°.

Dr. Heald believes this to be the first reported case in America of laparotomy successfully performed for intestinal obstruction.—*The Boston Medical and Surgical Journal*, September 3, 1885.

Umbilical Hernia. Operation after Seven Days' Incarceration.

Dr. W. GELLER reports a case of umbilical hernia in which operation was performed seven days subsequent to incarceration, June 6, 1885. Dr. Geller was called to the patient, a woman who had already been confined to bed for three days. The first symptoms were severe pain in the abdomen, accompanied by constipation and violent vomiting. The patient was 46 years old, and had borne six children after normal pregnancy, but during the seventh pregnancy she aborted, since which a small swelling in the umbilical region had been present. She, however, had until the present time experienced no inconvenience therefrom. The patient was disposed to constipation, and sometimes, though seldom, three or four days elapsed without movement of the bowels. On June 2 she experienced pain in the umbilical region, and extending to the pit of the stomach, apparently as result of a cold.

Vomiting, also, soon came on, and occurred with the advent of each attack of pain. Constipation next became established, and persisted in spite of all efforts to relieve it. Flatus in the mean time was absent, and hiccough still further complicated her condition.

Examination showed the face of the patient flushed and anxious, respiration frequent and superficial, but nothing abnormal could be detected in the condition of the thoracic viscera. The abdomen was much distended, painful on palpation, and tympanitic on percussion.

In the region of the umbilicus a tumor was present, round, and the size of an apple, hot to the touch, and extremely painful. The pulse was 120, temperature 100.4° F., respiration 36. Diagnosis incarcerated umbilical hernia.

The treatment was morphia with aq. laurocerasus, and warm baths, during which attempts were made to reduce the hernia by taxis. No success attending the treatment, a consultation was called with reference to the advisability of operation, and the conclusion reached that it was unadvisable.

June 7, the condition of the patient remaining the same, the preceding treatment having been continued, the patient urging operation, a second consultation was called, with the same result as that of the previous day. The treatment then pursued was morphia as before, with fragments of ice, cold applications, and copious injections. The condition, nevertheless, persisted unchanged, and now after more than seven days the family of the patient, notwithstanding the dissent of the consulting physicians, insisted on operation. Strange to say, in spite of the long incarceration, the intestine, though of an intensely violet color, showed no sign of gangrene. The operation was conducted with the greatest antiseptic precaution.

The hernia was composed of about five inches of the intestine, with scarcely any fluid. The incarceration was caused by the umbilical ring, which was so small as to fail to admit the end of the little finger, and dilatation therefore was made by a catheter, after which the introduction of a finger was possible.

After careful inspection and cleansing, the intestine was replaced. The greater portion of the hernial sac was removed, and after the introduction of a suture and application of a bandage the patient was put to bed and laudanum administered internally. Three hours later there was passage of flatus, and also movement of the bowels. The patient was in good condition, and lamented the postponement of the operation. The only unfavorable manifestation during convalescence was sloughing of the edges of the external wound. This, however, did not prove serious, and on the 20th of June the wound was entirely healed.—*Wiener Med. Presse*, July 19, 1885.

Hydronephrosis or Omental Cyst.

At a recent session of the Society of Russian Surgeons a female patient was shown who had been admitted into Professor PELYOHIN'S clinic with a huge tumor on the right side of the abdomen. The greatest circumference of the abdomen was ninety-five centimetres. The patient noticed the tumor seventeen years ago, it being the size of a fist. Afterwards it gradually became larger. Examination showed the existence of a tumor in the neighborhood of the right kidney, which on percussion gave a dull note, this dulness being continuous with that of the liver. Nevertheless, it was evident that the tumor was independent of the liver. It was slightly movable. The diagnosis lay between hydronephrosis and an ovarian tumor. The apparent connection with the uterus favored the latter view. The operation was performed on March 12th. When the peritoneal cavity was opened a cystiform tumor appeared, invested with a membranous formation, the vessels of which ran parallel to one another. No connection was found between the tumor and the uterus. Having divided the investing membrane, the tumor itself was opened, and it presented an immense cavity into which the hand when inserted penetrated as far as the diaphragm. In the upper part of the tumor a contraction existed, through which, however, the hand passed easily. No remnants of renal tissue could anywhere be discovered. Part of the tumor was excised, the remainder of the wall sewn to the peritoneal wound, and the cavity plugged with iodoform gauze, which was subsequently replaced by corrosive sublimate dressing, as the patient began to show symptoms of iodism. On examination, the liquid from the tumor, the quantity of which was 1000 grammes, was found to contain urea in almost the same proportion as that in which it exists in urine. Subsequently no urea was found in the secretion of the remaining portion of the tumor.

Professor Pelyohin, in his remarks on this case, said he was inclined to think that the tumor was not a hydronephrosis, but an omental cyst. In favor of this view were: (1) the number and disposition of the vessels; though most of those in the membranous investment were parallel to one another, some of them presented another arrangement, being interlaced with the parallel ones; (2) the laminar character of the structure; (3) the possibility of penetrating up to the diaphragm; (4) the constriction in the cavity, which might be the foramen of Winslow; and (5) the presence of depressions in the posterior wall of the cavity, this feature being peculiar to the peritoneum, which forms various protrusions.—*The Lancet*, August 29, 1885.

Traumatic Rupture of the Urethra; Urinary Infiltration and Recidivous Fistula

At a meeting of the Société de Chirurgie de Paris M. TERNIR read a report upon a paper of Dr. Cabadé, with the above title. The patient was a boy aged thirteen years, who, from a height of about ten feet, fell astride the ends of the staves of a headless barrel. M. Cabadé discovered swelling of the perineum, especially at the peno-scrotal junction, no appreciable fluctuation, but great pain upon touch, and slight ecchymoses. The scrotum was clammy and the penis in a state of semi-erection; no blood at the meatus. The bladder was full, and in efforts to urinate a few drops of blood escaped from the urethra. Temperature 99.5° F. Treatment, rest and application of cold compresses upon the perineum. The succeeding day after an uncomfortable night the symptoms were all aggravated. Retention of urine absolute; the scrotum, as well as the penis, was œdematous. The parents of the boy refused to allow deep perineal incision to prevent infiltration of urine, and accordingly only scarification was practised. The day following the perineum was livid and gangrenous in appearance. The scrotum was œdematous and dark, and the thighs were also the seat of an œdematous infiltration. Deep perineal incision was now practised, and a sanious fluid mingled with urine escaped. Two additional incisions were also made in the livid and indurated scrotal tissue.

By this treatment the general condition of the patient was improved, the urine draining off freely through the incisions, though considerable œdema of the prepuce still persisted. Five days after the accident, attempt to catheterize the bladder failed. A second attempt also was unsuccessful. A third effort, one week subsequent to the accident, with an olive-pointed bougie, was successful, but, on account of the pain produced, was necessarily withdrawn. Subsequently the patient was anæsthetized, and catheterization attempted, but unsuccessfully, both by the urethra and perineal wound. M. Cabadé at this examination found that the urethral canal was divided, so that the sound, after having passed through the penile portion of the urethra, refused further progress. At this juncture of the examination it became necessary to desist, owing to trouble of respiration due to the chloroform. At a subsequent examination entrance was made into the bladder with a probe by observing the point in the perineum at which urine escaped during efforts of micturition. A bougie was then introduced, and over this a catheter open at both ends. The sound thus introduced was exposed in the perineum for a distance of two-thirds of an inch. It was retained two days, withdrawn and replaced for four days, when an intense urethritis again necessitated its removal. However, at this time, the perineal wound was nearly cicatrized, and urination in great part accomplished by the penile portion of the urethra. Catheterization was performed daily with a No. 15 bougie (French scale). In May, 1884, M. Cabadé was again called to see the child, who for some time had been under the care of his parents only. Catheterization, which had at first been easy, gradually becoming more difficult, had been at length abandoned, and, from the rapid narrowing of the urethra and the consequent dilatation, a urinary pocket was formed in the perineum. This sac M. Cabadé incised, catheterization being impossible, with immediate relief to the child.

In the beginning of June, 1884, after preparatory dilatation of the perineal fistula with sponge, the procedure above detailed was repeated. The operation again was temporarily successful, though finally catheterization again became impossible, and the perineal wound was reopened. The patient at about the same time was attacked with acute tuberculosis, which proved fatal in sixteen days.

The Treatment of Patients affected with Disease of the Prostate.

Dr. Guyon, holding that the normal physiological condition of those affected with prostatic disease is congestion, formulates the following treatment for the affection:—

1. The avoidance of all causes of general or local chill.

2. The proscription of over-eating and alcoholic excess, and in general avoidance of *abuse*, rather than the simple use of salads, meats, fish, shell-fish, white wines, and champagne.

Not only should excess of irritating or alcoholic drinks be avoided, but also that of beverages in themselves inoffensive. For this reason the treatment of the affection by mineral waters should be advised with extreme caution.

3. *Voluntary and prolonged retention of the urine* should be avoided, as being conducive, in those affected with prostatic disease, to the production of retention of the urine, cystitis, etc.

4. Moderate indulgence in sexual intercourse.

5. Consideration of the unfavorable influence exerted by prolonged horizontal decubitus and immobilization.

Prolonged rest in bed should be avoided, and before retiring, the patient, if possible, should, if unable to walk in the open air, promenade in his room for fifteen or twenty minutes, and in the morning such exercise should be repeated.

During the day sedentary habits should not be contracted, but at the same time fatigue should be avoided.

Constipation should be obviated, if existing, without the use of drastic cathartics. A large enema, warm or cold, in the morning exercises at the same time an evacuating and a soothing effect. Emollient enemata, before retiring, frequently also yield good results.

6. The functions of the skin should be excited by dry friction and massage.

Baths should not be continued beyond fifteen minutes.

Dr. Guyon next considers the medicinal treatment of the affection, and suggests—

1. As a remedy for the *sclerosis* of the urinary apparatus, the use of potassium

iodide in quantity varying from eight to fifteen grains daily, during fifteen days or three weeks of every month, and continued for months or years.

2. For the *congestive lesion*, the careful administration of ergot, nux vomica, and all preparations containing strychnia as a base, is advised.

3. As remedies for *vesical irritation*, belladonna, hyoscyamus, and the preparations of valerian will be found more inoffensive than opium and its derivatives, but nevertheless sufficiently active.

The bromides are considered to have in vesical disease only an insignificant effect, but in some cases this should be utilized.

The foregoing hygienic and medicinal treatment, Dr. Guyon considers, will in most instances suffice to overcome the functional disturbances experienced by prostatics, and only when it fails should the use of the catheter be resorted to.—*Ann. des Mal. des Organs Genito-urinaires*, May, 1885.

Resection of the Body of the Sternum for Caries.

At a meeting of the Académie de Chirurgie de Paris, held June 17, 1885, M. LEON LE FORT reported a case of resection of the sternum for caries. The patient was a man 54 years of age, who, during the years 1879 to 1885, had had several abscesses in the sternal region. The patient was exceedingly emaciated. Several fistulous orifices existed over the sternal region, with thickened livid edges, from which escaped a darkish-yellow watery pus. At each inspiration of the patient the pus appeared at and receded from the orifices, but if the patient coughed or made any violent effort great quantities of pus escaped with a gurgling noise. It was evident, therefore, that these fistulæ communicated with a large pus-containing cavity, and on trial about one ounce of liquid was injected. Examination, by percussion and auscultation, showed that there was no pleural thickening or any sign of pulmonary tuberculosis. Examination with a probe showed that the sternum was bare at the level of the fistula, and by strongly curving the sound it was introduced upon the posterior surface of the sternum, and demonstrated also an extensively denuded condition of the posterior surface. The probe did not penetrate into the pleural cavities. The patient was in a state of extreme feebleness, aggravated by the refusal of all food, and it was evident that death would speedily result, unless operative procedure should be successful.

On April 30, 1885, after having anæsthetized the patient with chloride of methyl, M. Le Fort made a double transverse incision, united by a median incision, extending to the inferior part of the body of the sternum. With a cutting spatula, the two lateral flaps, comprising the skin and periosteum, were raised, thus laying bare the anterior surface of the bone. The fistulæ, however, were not sufficiently large to permit the introduction of Liston's scissors, and accordingly the bone was cut two-thirds through by scratching with the point of the scissors. Then, by introducing a knife into the cleft so made, the bone was entirely cut through. This done, M. Le Fort cut the second and third costal cartilages on each side, by which he was enabled to raise the bone and pass his finger behind it, confirm the absence of the periosteum, and also protect the mediastinum and pericardium. The second, third, fourth, fifth, and sixth costal cartilages on each side were successively cut, and it was then possible to see that the periosteum was entirely adherent at the base of the ensiform cartilage, and at this point the bone was cut with Liston's scissors. Further examination showed the existence of diseased bone at the superior part, and this was removed. The interclavicular portion of the sternum fortunately was free from disease.

The wound made by the operation extended from the first intercostal space to the sixth. The borders were formed by the costal cartilages and intercostal muscles; the bottom by a thickened but not soft membrane, covering uninterruptedly the mediastinal organs, and rising regularly at its inferior portion with the pulsations of the heart. The fragment removed measured four inches in length. Its anterior surface was healthy, but the deep surface was altered to some depth over its entire face.

The dressing consisted of compresses of tarlatan soaked in corrosive chloride solution of 6 grains to the quart. The immediate results of the operation were excellent, and it seems probable that recovery would have resulted had the patient partaken of food, but having become tired of life he persisted in his refusal, and died from inanition. He submitted to the operation, as was found out from a letter written to a friend, in the hope that he would die during its performance.

The Anatomy of Spina Bifida, and its Treatment by the Injection of Iodo-Glycerine Solution.

Dr. R. W. Parker, at a late meeting of the Clinical Society of London, presented the report of the committee appointed to inquire into this subject, of which the following is an abstract:—

Before attempting to discuss the results of treatment of spina bifida by Morton's or other methods, it was thought desirable to determine more clearly than had hitherto been done the pathological conditions included under that term. With this object, the committee undertook an examination of all the specimens of the deformity contained in the London museums, as well as in those in Cambridge and Glasgow, and sundry others placed at their disposal by different contributors to this report. The subject was therefore divided into two parts: first, the pathological anatomy of spina bifida; and, secondly, the treatment of the deformity.

I. *Pathological Anatomy.*—The term spina bifida was used to define certain congenital malformations of the vertebral canal, with protrusion of some of its contents in the form of a fluid tumor. With very rare exceptions, the malformation affected the neural arches of the vertebræ, and the tumor projected posteriorly; in rare cases, however, the bodies of the vertebræ were involved, and the tumor in such cases protruded anteriorly into the thorax, abdomen, or pelvis, between the lateral halves of the bodies affected. The museum specimens were discussed under the following, or some of the following, headings: 1, position of the tumor; 2, size and configuration of the sac; 3, coverings of the sac; 4, disposition of meninges within the tumor; 5, size and configuration of the deficiency in the neural arches; 6, disposition of the spinal cord and nerves; 7, unusual variations; 8, the process of cure. The result tended to show that the specimens fell under three chief divisions: 1, protrusion of membranes only (spinal meningocele); 2, protrusion of membranes, together with the spinal cord and its appertaining nerves (meningo-myelocele); and, 3, protrusion of the membranes, together with the spinal cord, the central canal of which was dilated so as to form the sac-cavity, the innermost lining being constituted by the expanded and atrophied substance of the cord (syringo-myelocele). As to the comparative frequency of these three varieties, the committee stated that the second, meningo-myelocele, was by far the most frequent, while simple meningocele came next, and syringo-myelocele last.

As a typical example of the common variety, a specimen now in the College of Surgeons was quoted. This was a case of lumbo-sacral spina bifida, of the size of a Tangerine orange, sessile, but constricted slightly at the point of attachment. The tumor presented normal skin for a short distance round its base, but the central portion consisted of a thin translucent membrane; along its vertical axis the tumor was slightly furrowed, this furrow corresponding to the attachment of the cord to the inner surface of the sac-wall. The spinal cord ran almost horizontally across the upper part of the sac, and then became incorporated with the sac-wall, from which also the lowest nerves arose; they then passed across the sac to gain the intervertebral foramina, from which they issued normally. The anterior and posterior roots of the nerves were separated from each other by an exaggerated ligamentum denticulatum.

Concerning simple meningocele, and cases where there was dilatation of the central canal of the cord, little was said, except that they might very easily be mistaken one for the other; for both sacs were free from nerves, and a careful dissection was often necessary in order to distinguish them. In some cases of meningocele, with a large communication with the vertebral canal, the cord could be seen lying at the bottom of the sac in the vertebral canal, and then there could be no difficulty about the diagnosis. Besides these three chief varieties, mention was made of several variations; among these, the division of the sac into smaller loculi, and the occurrence of bony outgrowths across the vertebral canal, buttonholing the spinal cord, were the most remarkable.

Careful microscopic examination of the sac-wall in a typical case of meningomyelocele had disclosed the continuation of the central nervous system within its median vertical portion, the integrity of the central canal of the cord within this part, and the absence of true skin over it. It further displayed the absence of any meningeal cavities behind the incorporated portion of the spinal cord. It was clear, therefore, in the first place, that the nerve-roots, which traversed the sac, arose from this intramural portion of the central nervous system, and that all expressions of descriptive pathological anatomy which implied a distribution of the nerves to the sac-wall were a reversal of facts. Even more important than this, the histology of the sac-wall in a typical case, by demonstrating the integrity of the central canal of the included portion of the cord, showed beyond dispute that the neural furrow did not remain unclosed in spina bifida, nor, after having been closed, was it subsequently distended by dropsy and ruptured. The absence of true skin from the central portion of the sac-wall was next adverted to. This fact implied that the mesoblastic basis of the true skin, and the structures lying in subjacent connection with it, had not been developed. The presence of the cord in the sac-wall offered no difficulty of explanation when its epiblastic origin was remembered. The theory, therefore, which best explained the pathological anatomy of spina bifida was that which assumed a primary defect of development of the mesoblast from which the structures closing in the vertebral furrow were developed.

II. *Clinical Course and Treatment of Spina Bifida.*—In order to form a correct estimate of the value of treatment by the injection of Dr. Morton's iodo-glycerine solution, the committee had endeavored to ascertain as far as possible the natural history of the deformity when untreated, and had prepared tables of cases treated in various manners for purposes of comparison. As regarded the natural history of the deformity, the Registrar-General's report for 1882 showed 649 deaths from spina bifida in England and Wales, of which 612 occurred under one year of age. The committee held that, though a certain number of these deaths were due to local causes—rupture of the sac, draining away of the cerebro-spinal fluid, and subsequent septic meningitis—yet in a large proportion of the cases death ensued from the marasmus and general defective nutrition frequently associated with the deformity, and which could not be remedied by any local or other treatment. The tables next dealt with treatment by injection with simple solutions of iodine, and showed a considerable amount of success. Then ligature of the sac was considered, and here again good results seemed to have been obtained. Excision likewise had a considerable proportion of success. The plan of repeated tapping and pressure gave the least successful results of any. The injection of Morton's fluid, according to the committee's tables, showed a percentage success of between 50 and 60. The high mortality was thought to be, in unsuitable cases, largely due to the treatment having been adopted on account of its simplicity and supposed safety. In spite of the favorable results of ligature and excision of the tumor as shown in the tables, the committee felt themselves compelled to report against these methods of treatment. There was reason to think that the published cases might be misleading, owing to some cases of failures not being recorded, while all the successes, being regarded as surgical triumphs, were almost certain to have been recorded. Moreover, it seemed probable that a careful selection of cases had been made. The committee, therefore, advocated the plan of treatment by injection—and preferably by the injection of Morton's fluid.—*British Med. Journ.*, May 30, 1885.

Treatment of Hydrarthrosis by Localized and Forced Compression, by Wadding and Bandages.

In an original memoir on the treatment of hydrarthrosis by means of localized and forced compression, by wadding and bandages, Dr. DELORME thus describes the method of applying the dressing to the knee. We begin by cutting a piece of wadding sufficiently long to extend beyond the foot, and reach above the middle of the thigh. The wadding, which should be moderately thick, is then lightly shaken to remove all folds, and to render it pliable and soft. The leg is then raised to remove the engorged venous blood and the cotton applied; all superfluous parts having been removed and the edges thinned, so that when overlapping they together shall be uniform in thickness with the remainder of the wadding. The limb still elevated the foot is covered with a Bauden's bandage of new linen carefully applied without folds or wrinkles and with sufficient firmness. The pressure thus made should gradually diminish from the toes to the instep. With the same care the wadding is exactly applied to the leg by circular turns and reverses until the condyles of the tibia are reached.

Having arrived at this point the bandage is laid aside until there is applied to the knee a roll of wadding having a diameter of a clenched fist and of the shape of a horseshoe, whose opening is in relation with the extremity of the limb and whose curvature embraces the base and sides of the patella. The form and dimensions of this pad enable it to adapt itself to the portion of the limb occupied by the subtricipital cul-de-sac and the lateral synovial prolongations, and to exercise pressure at their level. This pad is now held firmly in position by circular turns, from below upward, of the bandage already applied as far as the condyles of the tibia. Oblique turns of the bandage are then applied so as to embrace exactly the whole superior portion of the tampon, and fix it against the upper portion of the synovial cul-de-sac. When a sufficient number of oblique and circular turns have been taken, so that by somewhat firm pressure between the thumbs and fingers of both hands indentation is accomplished with difficulty, the bandaging is considered sufficient, and the operation concluded by fixing the wadding on the lower portion of the leg with additional circular turns.

In order to prevent the slipping of the bandage, Dr. Delorme places the limb in a trough and envelops the whole by a towel extending from foot to thigh. Most frequently the limb is placed in an upholstered trough, and the lower portion of the limb allowed to rest on two transverse horsehair pads, very thick and firm. Ordinarily, immediately after the application of the bandage, the toes become cold and assume a red tint, and sometimes a livid hue which commonly disappears after a few hours, and frequently passes away in twenty-four hours without the least inconvenience. Slightly increased elevation of the limb, compression of the toes, and slight pressure upon the wadding around the knee, suffice to remove the local stasis. A few hours after the application of the apparatus, and especially at night, pain and cramp of the calf of the leg appear and require the administration of opium or morphia. The day succeeding the application of the bandage, if owing to the disappearance of the effusion the dressing has become less firm, additional turns of a roller should be applied until the dressing attains the same degree of firmness it originally possessed.

This treatment is persisted in until the eighth or tenth day if the disease is acute, and until the fifteenth day if it be chronic, hydrarthrosis.

In a *résumé* of his observations upon the application of the foregoing treatment, Dr. Delorme holds it to be especially applicable in the following cases:—

1. In acute hydrarthrosis, one or several days after its initial symptoms, localized compression has a most favorable influence. In eight or nine days we have commonly found swellings of the knee of rheumatic or traumatic origin to disappear, but, in some cases, this has occurred even sooner. In one case in which there was considerable hydrarthrosis of the knee, combined with slight contusion of the joint, was observed on the removal of the dressing on the fifth day (and after the fifth day observation has shown that it is scarcely necessary to renew the bandages) an entire or almost entire disappearance of the exudation. But as it is difficult to replace any appliances once removed, and as it is frequently necessary to apply an entirely new dressing, it is advisable not to interfere with the limb until a few days beyond this limit. On the contrary, after the removal of the first apparatus on the eighth day, it was necessary in some cases to apply a second, which was left in position for five or six days. However, the point to be remarked is that no cases of acute hydrarthrosis which have come under notice have proved refractory to the treatment proposed, that they have always disappeared in a very short time, and that with one exception no return of the affection has been observed. In chronic hydrarthrosis the disappearance of the effusion was accomplished almost in the time indicated, but the consecutive treatment was continued longer. Although those suffering from acute hydrarthrosis may be discharged toward the end of the first month, those having chronic hydrarthrosis of the knee are retained two months, during which time a sufficiently firm pressure is maintained upon the joint in connection with faradization of the anterior muscles of the leg.

2. Swellings of the knee observed during the course of blennorrhagia are, as is known, very refractory to all therapeusis, while, on the other hand, it is necessary to cause their speedy disappearance in order to avoid articular rigors and anchylosis. Observation seems to demonstrate that the method under consideration causes exudations of blennorrhagic origin to be observed almost as rapidly as traumatic or rheumatic effusions. One of two cases treated was affected with blennorrhagic arthritis of both knees, and for nearly a month was treated without success by simple immobilization, flying blisters, and all other means commonly employed. The exudation was considerable and the pain severe. Firm localized compression in six days caused the swelling on both sides to disappear.

3. In many cases of army practice we were able to apply the treatment at the moment of an accident, after a fall upon the knees, a shock received upon an articulation, a twist of the knee, in a word, after traumatisms which were sufficient to cause swelling of the joint; equally it is indicated to prevent effusion by appropriate compression. This practice, entirely rational, is commonly employed in veterinary medicine, with race-horses, to prevent synovial effusions in the sheaths of the tendons.

4. *Hemorrhagic hydrarthrosis*, which complicates fractures of the patella, interposes such an obstacle to the coaptation of the fragments that most surgeons

to-day seek to remove the exudation before treating the fracture. Compression and puncture have been employed without result. The first is censurable, as ordinarily employed, from the fact that it produces tardily the desired result, and diminishes the chances of a bony union. The second, much the more sure, is perhaps not so harmless as its partisans hold. The method now proposed, in view of its results, Dr. Delorme considers the safest and least objectionable, and at the same time the most successful.

5. The rapidity with which localized compression causes the disappearance of an effusion may perhaps be utilized as a means of differential diagnosis in certain cases where doubt exists as to whether the swelling is due to chronic hydrarthrosis or white swelling. Although the latter is relatively little amenable to the influence of compression, the first on the contrary disappears rapidly.

In conclusion Dr. Delorme calls attention to the fact that in diseases of the joints treatment is never to be considered completed (especially in hydrarthrosis) as soon as the swelling has disappeared, and advises—

1. The continuance of a conservative compression as a safeguard against return of the disease.
2. Immobility of the joint to prevent excessive secretion of the synovial fluid.
3. Electrization of the peri-articular muscles.—*Archives de Méd. et de Pharm. Militaires*, July 16, 1885.

On Erasion (so-called Arthrectomy) of the Knee.

Mr. G. A. Wright, in *The Medical Chronicle* of July, 1885, describes the operation of erasion of the knee, first employed by him as a substitute for arthrectomy:—

The operation consists in opening the joint freely by a semilunar incision, just as in the ordinary mode of excising the knee; the skin is reflected and the capsule removed on each side of the patella and patellar ligament, or, if preferred, the patella may be sawn across, and the fragments turned upwards and downwards. If the former plan is employed, free incisions parallel to the long axis of the limb are made on each side of the patella, extending a little above its upper border as well as downwards nearly to the insertion of the ligamentum patellæ into the tubercle of the tibia; the object of this is to allow the patella to be freely displaced laterally, and turned round so as to expose its articular aspect during the process of erasion.

The rest of the operation consists in carefully cutting away with forceps and scalpel or scissors every particle of pulpy granulation-tissue, all the infiltrated capsule, and the semilunar cartilages, and scraping quite clean all the articular cartilage, picking out granulation-tissue from any pit in the cartilage, and, if necessary, gouging away any small spots of diseased bone. The process must be most thorough, and extreme flexion of the limb is required completely to expose and clean the posterior part of the joint; the crucial ligaments are scraped, but carefully preserved, the lateral ligaments usually divided.

The upper synovial sac must be thoroughly cleaned. The most difficult part of the operation is getting away the posterior part of the semilunar cartilages and the synovial membrane at the back of the joint.

The process is a tedious one, often lasting one and a half or two hours, including the subsequent putting up in a splint. As soon as all bleeding has been stopped, the limb is fixed on an excision splint and dressed in the usual method, antiseptically. Wood wool is the dressing preferred from its very perfect absorbent properties, and the firm even support it gives; drainage should be at the back of the joint on each side as after excision, the tubes being carried through openings made behind the joint. Mr. Wright prefers to Esmarch the limb before beginning the operation.

OPHTHALMOLOGY AND OTOLOGY.

Panotitis in Scarlatina-Diphtheritis.

Dr. OSCAR WOLF, at the close of an interesting paper upon Panotitis in Scarlatina-Diphtheritis, in speaking of the treatment, says:—

So far as the therapeutics are concerned, all those cases show us that the means known to us are not able to oppose the injurious operation of the diphtheritic exudation, even in the first few hours of the ear trouble. Masses of partially organized exudation appeared in the tympanic cavity, and that, too, in the most delicate parts; if we had now instilled a ten per cent. alcoholic solution of salicylic acid, it would have remained for the most part on the upper surface of the exudation without availing anything, even if it had really reached the tympanic cavity, while, on the other hand, if it had reached a vulnerable spot, it could have caused even a rupture of the fenestral membrane. We must, in my opinion, in such cases, refrain from attempts to influence the diphtheritic process itself, and be satisfied with emptying as quickly and completely as possible the tympanic cavity of exudation, and ought only to resort to disinfecting means that do not corrode.

By the use of pilocarpin injections in the first place we are enabled to loosen more easily and effectually the diphtheritic exudation, and at the same time the labyrinth is speedily relieved, especially by the marked increase of the secretion of the mucous membrane of the tympanic cavity. But this treatment is very much interfered with, and that, too, at the height of the disease, by the somnolence and tendency to cardiac weakness induced by it, with no inconsiderable danger to the life of the patient; one should, therefore, begin very cautiously, with very small doses of this medicine, and only after careful examination of the general condition.—*Archives of Otology*, June–September, 1885.

Ménière's Disease.

LORENZ ECKERT, in a treatise upon Ménière's disease, reviews all hitherto published cases and articles pertaining to this pathological condition. From these and fifteen as yet unpublished cases of Burckhardt-Merian, the author attempts to draw a distinct anatomical basis for the various symptoms of Ménière's disease, and arrives at the following conclusions:—

1. The semicircular canals, with their ampullæ, are the organs of the sense of co-ordinate motion, directly for the head, indirectly for the entire body.

2. The localization of sound is determined by binaural power of hearing. The semicircular canals take no part in this, but possibly exert acoustic functions in other respects.

3. The appearance of the various symptoms of Ménière's disease is in most cases attributable to a diseased state of the terminal apparatus of the acoustic nerve in the labyrinth. It is only in rare instances that these are called forth by pathological changes in the adjoining nerve-centres.

4. Pathological changes of conditions in the middle ear and in surrounding structures, producing a change in the intra-labyrinthian pressure, may call forth a similar train of symptoms.

5. The symptoms are induced by an irritation of the labyrinthian organs or their nervous centres. Complete destruction of the same seldom calls forth a loss of function.

6. Disturbances of co-ordinate motion may be absent in pronounced chronic or acute affections of the labyrinth.

7. Constitutional diseases, such as lues leukæmia, epidemic parotitis, and tabes, are recognized factors predisposing to the development of Ménière's disease.—*Archives of Otology*, June–September, 1885.

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The Treatment of Mastoid Suppuration without the Use of the Trephine.

LŒWENBERG, at the conclusion of an exhaustive discussion of the treatment of suppuration of the mastoid cells without resorting to the trephine, expresses his views as follows:—

In the treatment of mastoid suppuration, before resorting to trephining, hitherto considered the only therapeutic measure applicable to the treatment of the affection, I advise scrupulous and patient use of the following measures, whose practice has frequently enabled me to avoid this operation, which is always dangerous, and sometimes impossible on account of the peculiar structure of the bone:—

1. In order to obtain an easy exit for pus accumulated in the mastoid apophysis, through the drum and auditory meatus—

a. Enlarge considerably the small perforation of the tympanic membrane. In cases where spontaneous perforation has occurred too high for the ready escape of pus, a counter-opening below should be made.

b. Frequently practice insufflation of air through the Eustachian tube.

c. Cleanse the diseased cavities several times a day by free and forcible injections of saturated solutions of boracic acid, or of weak solutions of corrosive sublimate.

d. Destroy vegetations or polypi if they are present either in the auditory canal or tympani cavity.

2. Institute at once energetic and careful antiseptic treatment.

In this connection abstain from the employment of all emollients, which can only conduce to the multiplication of microbes, constantly present, and begin treatment at once with a saturated solution of boracic acid in absolute alcohol, whose use has already been suggested in otorrhœa, and which I consider as corresponding to all the indications here necessary to be employed. In beginning its application the alcohol should be used as concentrated as possible, and gradually strengthened until it can be endured entirely undiluted.

3. In case of necessity open the abscess formed at the mastoid apophysis, introduce a drain, and cover the external openings with the impalpable powder of boracic acid, over which absolute alcohol should be sprinkled several times daily.

Prof. Lœwenberg adds that, having employed the measures indicated above for six years, in the treatment of mastoid disease, frequently of a serious character, he can warmly recommend its careful and patient application.

Trephining in a great number of cases is rendered superfluous, and only becomes necessary when sequestra are present, or some other vital indication exists.

The writer finally remarks that trepanning, instead of being the rule in the treatment of this affection, as many authors insist, should only be exceptionally performed, and as a last resort.—*L' Union Médicale*, August 29, 1885.

MIDWIFERY AND GYNÆCOLOGY.

Inguinal Hernia of the Right Horn of the Pregnant Uterus.

Dr. HEINRICH EISENHART, at the conclusion of a report of a case of inguinal hernia of the right horn of the pregnant uterus, in which the condition was correctly diagnosticated previous to operation, sets down the following points to be observed:—

Pregnancy, he says, must be determined to be present or absent, according to the subjective and objective symptoms presented. Whether the pregnancy is intra- or extra-uterine, or whether the pregnant uterus, tube, or ovary is contained in the hernial sac, must be determined by observation of the following points:—

1. Extra-uterine pregnancy almost never is complicated with rupture of the uterus. Of this, a single case, involved in much doubt, is reported (Skrivan and Lumpe). Moreover, it must be recollected that tubal pregnancies, which are much more numerous than ovarian pregnancies, almost invariably terminate during the first months through rupture of the containing sac, a circumstance to be considered if the pregnancy under consideration has reached the sixth, seventh, or a later month. Finally, it must be held in mind that inguinal hernia of the pregnant uterus does not belong to the catalogue of rare exceptions.

2. The form of the body present in the hernial sac, in hernia of the uterus, is similar in shape to a pear, the broadest portion being below, the smaller portion extending into the entrance of the hernial sac. This peculiarity is one by which the diagnosis may be confirmed, especially if the ovary can be felt in near relation with the tumor.

3. Vaginal examination, more certainly than all else, will permit a correct diagnosis to be made. Bimanual examination will enable a decision to be reached, that the body in the hernial sac, and that recognizable in the vagina, are one and the same, while combined investigation of the bladder and rectum will detect any deviation of the uterus from its normal position. Concerning the latter, an anomaly in the formation of the uterus may be a source of error, especially should the organ be bicornate, and therefore predisposed to hysterocele. Nevertheless careful examination will enable a correct conclusion to be reached. Introduction of the sound is only justifiable when abortion, either natural or artificial, appears unavoidable.—*Archiv für Gynækologie*, Bd. xxvi., Hft. 3.

Eclampsia and the Albuminuria of Pregnancy.

MM. DOLERIS and POUEY, at a meeting of the Société de Biologie, held July 17, 1885, in a communication concerning the albuminuria of pregnancy and eclampsia, make the following statement of the results of their investigations:—

1. Contrary to the opinion generally accepted, the urine of pregnant women rarely contains albumen. In experimenting with women arrived at the ninth month of pregnancy, a period most favorable for the appearance of albuminuria, in some hundreds of cases, after analysis with the most sensitive reagents (that of Tanret in particular), albuminuria was found in twenty cases only.

Albuminurias observed at the beginning and during the course of labor must be disregarded.

Here, indeed, they are a little more frequently met with, but they constitute a transient accident, due to diverse causes, isolated, or temporarily united to produce such result—nervous excitation, elevation of blood-pressure, compression and sometimes contusion of the bladder by the mechanical engagement of the fœtal head, followed by extravasation of serum into the urinary reservoir.

The authors have intentionally disregarded observations on this point.

It ought not, however, to be forgotten that phenomena belonging to secret labor may appear several days before true accouchement, and that albuminuria may on this account appear during the last days of pregnancy.

2. *A.* By the careful as possible use of processes (tubes, and sterilized catheters, and heated antiseptic washing of the vulva, repeated many times, etc.), the authors collected directly by catheterization the urine of fifty pregnant women, in order to make a microscopic examination and culture in view of search for micro-organisms.

In this number were comprised but few women affected with albuminuria.

In these fifty cases they found microbes in a proportion of one to five, under the form of bacilli, and more rarely under the form of micrococci. Their presence seems to be explainable in those women the kidneys of whom were functionally normal by the existence of a vaginal catarrh, whose secretion, in spite of the precautions taken, reached the catheter. In every case in which the microbes were very abundant, such catarrh was found to exist.

B. In twenty women in whom there was albuminuria, the presence of the microbes was constant. The micrococcus under various forms peculiar to it was always present: monococcus, diplococcus, staphylococcus, and principally the streptococcus.

From the constancy of these results denial of the existence of non-microbian transitory albuminuria could not be absolutely made. However, it must be very rare.

3. As to the blood of pregnant women who have albuminuria, it appears, from the researches of MM. Doleris and Poney, that, although albuminuria is always accompanied by the presence of microbes in the urine, the condition does not imply their presence in the blood. At least culture of a drop of blood taken from the extremity of a finger has not always been fertile. From this, however, the absence from the blood of micro-organisms cannot be absolutely concluded, but it can be considered that they are rare, or localized in a region with little connection with the blood-current, in those cases in which the experiments have been negative.

4. In all cases in which albuminuria eclampsia was observed by the authors, the urine contained micro-organisms rendered evident by culture.

The blood was examined and cultivated in two cases with positive result. The authors do not take into consideration the less precise researches made in three other cases. But as to the two positive cases, the one permitted the recognition, with astonishing precision, of the progress of the affection, and an advance parallel with the microbic infection of the blood and urine. Some hours after the beginning of the convulsions, a culture of the urine and blood made in six *ballons* containing sterilized bouillon, rendered slightly alkaline, was made.

The urine contained at this time mobile points in great abundance, and the blood also contained more abundant mobile granular bodies than normal. Examination of the cultures made two days after showed the presence of the staphylococcus and abundant granular rings comprised of from 10 to 20 grains from 1 mm. to 2 mm. in diameter.

A new culture of the urine made six days after the cessation of the convulsive attacks, the urine still containing albumen, gave the same results. Six days later, when the albumen had completely disappeared, a third culture of the urine remained sterile, and negative results were maintained up to the discharge of the patient.—*Archives de Tocologie*, August, 1885.

Cysts of the Vagina.

Dr. **THALINGER**, in a treatise on this subject, considers cysts of the vagina—

1. As cysts of retention. This opinion can be sustained only with difficulty, inasmuch as the existence of cysts of this portion of the vaginal mucous membrane is not yet certainly demonstrated.

2. As hygromas. This view probably is supported by the greatest number of observers.

3. As cysts of the canal of Gärtner, an explanation applicable to a few instances only.

These cysts arise from mechanical predisposing causes, chief among which is accouchement, since traumatism is the only determining cause whose action is probable.

The treatment suggested as giving the best results is incision, followed by caustic injections into the cavity.

Hydroceles of the neck of the uterus treated by puncture and injection of iodine have given rise to serious accidents. In the vagina, as in the cervix uteri, the cysts are in relation with extremely vascular regions in which the reaction due to the injection is too energetic; and though some writers—Fleetwood, Churchill, and Scanzoni—employ no other method, notwithstanding their authority, the operation in every instance should be performed only after due consideration.

Thalinger further argues against the operation by puncture by holding that should the cyst be deep-seated it is difficult to reach, and it is therefore difficult to avoid injecting a great part of the caustic solution into the vagina, in which case the operation is very uncertain of success, Scanzoni himself saying that it should be repeated for six days in succession.

Having discussed the operation by puncture, M. Thalinger considers the operation by incision, which he unhesitatingly pronounces the preferable procedure.

This method is the one practised by M. Tillaux. The parts are first treated with a solution of cocaine, after which the sac is incised and injected, first with solution of carbolic acid, and then with four per cent. solution of the chloride of zinc. The incision is made without difficulty, and the only precaution to be taken is to avoid wounding the bladder or urethra in the front, and the rectum in the rear, by extending the incision beyond the walls of the cyst.

As precautionary measures, Dr. Thalinger suggests the introduction of a sound into the bladder, or the introduction of the finger of the left hand into the rectum. As a further precautionary measure, the blade of the bistoury may be enveloped by lead-plaster, and only a small portion of its cutting edge exposed.

Excision.—This method, next considered, is pronounced not "always irreproachable," because in many instances, especially in large cysts, cicatrization is not always prompt, but is frequently followed by the appearance of persistent fistulæ.—*Revue de Thérapeutique*, August 15, 1885.

Fibroid Tumor of the Uterus—Extensive Cancerous Degeneration and Ascites in a Girl thirteen years of age.

Dr. **VON KÖNIG** reports the case of a girl thirteen years of age in whom, along with uterine fibroid, there were present also cancerous degeneration and ascites.

The history is as follows: The patient, whom he first saw October 25, 1884, complained of pain in the left side of the belly, loss of appetite, costiveness, and disturbed sleep. The temperature of the skin was scarcely elevated, the secretion of the urine normal and contained no albumen. The pulse was 108. The menses first appeared in March, 1884, and disappeared in April. After this they again became established regularly, until the middle of October, when they again failed to appear. Since this time the preceding symptoms began to be developed. Examination revealed considerable abdominal enlargement, presenting the uniformly rounded appearance observed from the fifth or sixth month of pregnancy. The abdominal walls were tensely stretched and of variable resistance. On the right side was felt an underlying hard body whose limits were not recognizable on account of the tense condition of the abdominal walls. The firm spot was unyielding and immovable. On the left side the abdominal wall was elastic, fluctuating, and painful. Percussion, as far as the upper abdominal region, was tympanitic. Change in position of the body caused no variation in the fluctuation or percussion sounds. Auscultation of the abdomen revealed no signs of importance. The breast was slightly developed, flabby, and not painful. The nipples were small, and on pressure discharged no fluid. Examination made by a skilled midwife showed the vaginal orifice not closed, the vaginal portion of the uterus high up and directed slightly backward, somewhat softened and closed. No fœtus was recognizable through the vaginal walls. A later examination made by Dr. Von König revealed the same condition as above. The patient confessed to have had intercourse the middle of June. The painful abdominal symptoms soon disappeared, but the abdominal secretion increased, and in the course of several weeks a marked dropsical condition was developed. There was œdema of the abdominal cutis, genitals, and the lower extremities. The upper portions of the body were emaciated. Secretion of urine nearly ceased. The urine was dark brown, acid, and laden with the uric acid salts. The patient had continuous fever; the pulse was 120, small and feeble. There were loss of appetite, constipation, failure to sleep, and difficulty in breathing. All medication was ineffectual. Dyspnœa existing to such a degree as almost to cause suffocation puncture was made February 12, 1885. The trocar was introduced midway between the umbilicus and the spine of the ilium, and about two gallons of fluid were evacuated. The first portion of the fluid which escaped was of a brownish-red color, and the last of a whitish color.

After the evacuation of the fluid the left side of the abdomen was sunken in, while the right still maintained the form of the abdominal arch, and through it could be felt a hard, immovable tumor the size of a child's head, and extending into the pelvic cavity. The fluid discharged had a specific gravity of 1.0415, was alkaline in reaction, and abounded in albumen.

After puncture the patient felt much relieved; dyspnœa much relieved. Sleep and appetite returned, and every day a quantity of straw-colored urine containing no albumen was passed.

After a few days, however, the condition of the patient again became unfavorable, and in addition a new symptom was manifested.

This was a painful swelling in the right breast, which extended from the inner border of the left mammary gland over the sternum to the right breast. The swelling enlarged rapidly, was irregular, uneven, traversed by enlarged veins, and exceedingly painful. The collection of fluid in the abdominal cavity again necessitated puncture, the same symptoms as existed before having presented themselves. The fluid withdrawn was the same in color and nature as that originally obtained. Improvement again followed the operation, but was of shorter duration, and within a week the patient was seized with vomiting, during which quantities of dark-red-colored water mingled with mucus were discharged from the stomach. All efforts to control the vomiting were unsuccessful, and after persisting for three days the patient became so enfeebled that she was unable to rally, and died March 19, 1885.

Post-mortem examination showed the tumor in the breast to be a medullary carcinoma.

Examination of the abdominal cavity showed, after the escape of several quarts of a clear brown ascitic fluid, the presence of a tumor as large as a man's head, extending from the pelvic cavity to the umbilical region, and adherent to the right abdominal wall. Further examination showed the tumor and the uterus to be filled with one and the same neoplasm. The substance of the uterus with the exception of the vaginal portion was converted into a tough fibrous mass, which on section gave exit to a cream-like fluid similar to that found in the diseased breast. The walls of the uterus formed a sac whose walls were about two-fifths of an inch in thickness and which collapsed when cut. The cervical canal was easily distinguishable and permeable to a probe. In the sacciform cavity of the uterus was a neoplasm as large as a child's head, weighing from seven to nine pounds. The tumor, firm, fibrous, and easily cut, contained cavities varying in size from that of a hazelnut to that of a hen's egg, which were filled partly with firmly coagulated fibrin and partly with bloody serum. The microscopic appearances showed the growth to be fibro-cystic.

There was no trace of either fœtus or membranes. The annexa of the uterus, intestines, and mesentery, and some portions of the peritoneum, contained medullary carcinomatous nodules.—*Allgemeine Wiener med. Zeitung*, June 16, 1885.

A Contribution to the Study of Cysts of the Ovary developed in the Cavity of the Pelvis.

Dr. GUICHARD, after a study of a rare case of dermoid cyst of the ovary, in which operation was successfully performed by vaginal incision, lays down the following rules as to surgical interference with the growth :—

From an operative point of view Dr. Guichard distinguishes two classes of dermoid cysts of the ovaries :—

I. Cyst located in the greater pelvis.

II. Cysts located in the smaller pelvis.

Of the second class he recognizes two classes :—

1. Cysts which have a tendency to be developed in the abdominal cavity, and are accessible by the abdominal wall.

2. Cysts which have a tendency to be developed deeply in the pelvic cavity, and are accessible by the vagina and not by the abdominal wall.

If the dermoid cyst is diagnosticated at an early period, and while in an uncomplicated condition the expectant treatment is alone indicated. When, however, it is first seen to be in an inflammatory condition, and when increase in volume will endanger the life of the patient, operation is necessary. In cysts which are developed in the pelvic cavity, and which are in relation with the abdominal wall, gastrotomy is the only treatment, and observation seems to show that the operation is more favorable in prognosis than in that for serous cysts of the ovary.

In some cases dermoid cysts of the pelvis are accessible through the abdominal wall, and cure is possible after incision and drainage ; a long time will, however, be required in order to accomplish the union of the thickened abdominal walls, especially if suppuration is established in a cul-de-sac with sloping walls, in which case it will be preferable to try drainage and puncture of the sac by its inferior wall. Whether gastrotomy is possible in this variety, experience only can demonstrate.

Other dermoid cysts of the variety now under consideration, which are deeply situated at the base of the broad ligament at the side of the hollow of the sacrum, which are congenital or the result of inflammation, having firm adhesions with the circumference of the pelvis and the neighboring organs, and which have a tendency to develop at the side of the vagina without intimate relation with the abdominal wall, do not appear accessible to operation by gastrotomy. This operation is, perhaps, not impossible, but appears compassed with difficulties, and serious in its results. In reality the cyst has intimate relations with the uterus, and simple ovariotomy is not to be practised alone, but along with it hysterectomy is required. The patient after recovery will be sterile, while in the operation by vaginal incision (as described by Dr. Guichard) pregnancy has occurred under normal conditions eight years subsequent to operation—a fact which constitutes a powerful argument in favor of the latter procedure.

Incision at the dependent portion, through the vaginal wall, seems to be specially indicated. As exploratory puncture is always necessary, it will be sufficient to introduce a grooved sound and cut toward the cervix uteri with a blunt bistoury or tenotome, taking care to avoid the larger arteries always present in the vaginal walls or in their neighborhood, in order to escape the danger of serious hemorrhage, the control of which is always a matter of extreme difficulty. Then, after evacuating the cavity of its contents, it should be cleansed with rectified ether, as suggested by M. Bernutz, and drainage-tubes of sufficient size introduced, and strict antisepsis resorted to. Labarraque's solution seems solely to modify the disagreeable odor, and solution of the bichloride of mercury is perhaps to be preferred. Suppuration will persist for a long time. In the case recorded it lasted for six months. Injections of the tincture of iodine or cauterization will be necessary as a final procedure to cause complete cicatrization of the sac. For a long time a deep cicatrix will remain, an unyielding cord immobilizing the uterus. This condition—as well as any existing uterine complications—time, hygiene, and well-directed treatment will remedy.—*Archives de Tocologie*, July, 1885.

The Thermo-Cautery in the Treatment of Chronic Metritis.

Dr. E. SCHWARZ, in a paper upon the treatment of chronic metritis, advocates the use of the thermo cautery, and reports most satisfactory results from its use in thirty cases so treated. Complete cure and permanent alleviation of the symptoms have not resulted in every case; but this, he says, is not remarkable when the pathological and anatomical foundation of the affection is taken into consideration. In about one-third of the cases in which the wedge-shaped excision, recommended by Schrœder and Martin, was indicated, Dr. Schwarz, by means of the knife-shaped galvano-cautery, burned from each lip of the uterus a wedge-shaped portion of tissue about one inch in length, the same breadth, and from one-fifth to two-fifths of an inch thick at the base. Commonly, the same effects were obtained by the use of the cautery as with excision with the knife. In special cases the size of the portion removed was determined by the degree of hypertrophy existing. Ordinarily, without fear of persistence of the diseased condition, a portion of the diseased membrane from one-fifth to one-third of an inch broad can be allowed to remain. This, after the disappearance of the abnormal condition of nutrition, rapidly shrinks and returns to a normal condition, so that in from four to six weeks the parts are found fully covered with normal mucous membrane as far as to the os uteri.

The application of the cautery is made in a few minutes. No assistant is necessary. A glass speculum neither too long nor narrow is required, and in order to avoid making this too hot a short pause is made in the application of the cautery, during which irrigation is practised. Ordinarily, the pain experienced by the patient is not severe, and she fails to discover the occurrence of anything unusual unless previously advised of the operation intended. Moreover, patients who complained of severe pain from scarification of the parts experienced no unpleasant sensation from the use of the cautery. After the operation the cauterized parts were dusted with iodoform and the vagina packed with antiseptic gauze. The patient usually kept her bed only two or three days.

Separation of the eschar usually occurred during the first eight days. Extensive suppuration as a result of the operation has not been noticed, but under the use of the iodoform tampon or sublimate gauze and irrigation, healing without extensive discharge has always quickly resulted.

In other cases in which such extensive hypertrophy did not exist, but in which it was necessary to reach the numerous dilated bloodvessels, the wedge-shaped cauterization was not practised. A pointed cautery was used by which was burned into each lip a number of holes from one-fifth to three-fifths of an inch deep, and about the diameter of a goose-quill. Cicatrization under these circumstances occurred more rapidly than in the cases first noticed, and without notable suppuration.

Hemorrhage was observed neither during nor after the operation, nor as a result of the separation of the eschar, and likewise but little inflammation or marked stenosis of the os uteri was noticed.

In every case there was marked and lasting improvement of the condition; in no case was the condition of the patient rendered worse. The results anatomically correspond to those clinically obtained.

In all cases there was more or less considerable diminution of the uterus, and a decrease in its vascularity. In some cases, however, it was found necessary to repeat the operation, owing to insufficient cauterization at first.—*Centralbl. für Gynäkologie*, July 18, 1885.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

Investigation of the Nature and Properties of the Ptomaines.

Alkaloids as agents in the causation of symptoms of disease have grown into great prominence during the past few years. The interest that attaches to "cadaveric alkaloids" is both pharmacological and forensic. Perhaps no one has done more for the advancement of our knowledge of ptomaines than Professor **Brieger**, who has recently published *Weitere Untersuchungen über Ptomaine.*[1] As far back as 1866 Dupré and Bence Jones noted the presence of alkaloid-like substances in all the organs, tissues, and fluids of human and animal bodies. Owing to the fluorescent appearance of the solutions of this alkaloid in weak sulphuric acid the name of "quinoidin" was given to it. Nevertheless, Dupré and Jones did not succeed in obtaining ponderable quantities of the pure substance. In 1869 Sonnenschein and Zülzer obtained from a maceration of muscle an alkaloid having the property of dilating the pupils of rabbits and dogs. When injected into the jugular vein of rabbits, it increased the number of beats of the heart, and in two animals completely stopped the peristaltic action of the intestines. Rörsch and Fassbender found in 1871 in the liver, spleen, and kidneys, by the Otto-Stass method, a body having alkaloid properties. It was a tasteless, uncrystallizable substance, and gave, with phospho-molybolic acid, a precipitate, which by warming and the addition of ammonia assumed an intensely blue color. In the same year Schwanert extracted from the putrefying intestines, liver, and spleen of a child that died suddenly a peculiar-smelling fluid body that dissolved in ether. On the supposition that this was an alkaloid formed during putrefaction, Schwanert analyzed the completely putrefied abdominal organs of a male corpse, and obtained a golden oil that smelt of propylamine, had a somewhat bitter taste, and gradually evaporated. The hydrochlorate of this body gave various reactions like those of alkaloids, but its toxicology was not investigated. L. Liebermann extracted from a putrefying stomach a coniine-like substance, which was taken up by ether from either alkaline or acid solutions. This substance had no poisonous properties. Traces of arsenic were found in the same stomach. In a trial for murder by poisoning, held at Brunswick in 1874, the expert in chemistry discovered, besides arsenic, a coniine-like base that Otto regarded as a ptomaine. It did not give the characteristics of nicotin, though resembling it in some respects. It was deadly poisonous, and killed a frog and a pigeon very rapidly. A similar kind of alkaloid was detected by Brouardel and Boutmy in the corpse of a woman who had died with symptoms of cholera, and who had partaken of a stuffed goose with ten other individuals. The base was also detected in the remains of the unwholesome goose. The substance was volatile, smelt strongly of mice's urine, and gave several reactions like those of coniine, though it differed in remaining colorless with muriatic acid, and could not be oxidized into butyric acid. It proved poisonous to frogs. In the cadaver resulting from prussic acid, and also in another due to charcoal fumes, the same authors discovered an alkaloid having a likeness to veratrin. Somewhat similar substances were also found in a body dead from arsenic, in one that had lain in water eighteen months, and in another that had succumbed from asphyxia. Wolkenhaar, again, extracted from the intestines of a woman who died from the excessive use of alcohol an alkaloid-like body having many features in common with nicotin; it was not toxic in its action. Morriggia and Battistini stated that dead bodies yielded much larger quantities of poison eighty days after burial in warm summer weather than when they were investigated in a shorter time after interment. These statements were made as the result of physiological experiments on frogs and rabbits. Extracts of the putrid tissues were made with pure or acidulated water, ether, ethyl-alcohol, or amyl-alcohol, and injected into the animals mentioned. Falling off in the number of heart-beats, loss of motility and sensation, and stoppage of the heart in systole were the phenomena noted.

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[1] Berlin, A. Hirschwald, 1885.

The name of Selmi stands out most prominent in this field of work. It was he, if we mistake not, who first coined the word "ptomaine," which indicated the cadaveric origin of the alkaloids. It is now known that bodies undistinguishable from those discovered in the cadaver occur under many other circumstances. We may refer our readers to the article by Dr. Wolfenden, published in *The Lancet* of 1883, vol. ii. p. 852. The investigations of Guareschi and Mosso may also be mentioned (*The Lancet*, vol. i. p. 827, 1883). Brieger lays much stress on the following propositions: That in the different stages of decomposition in the human body different basic products are formed; that many ptomaines disappear, their place being taken by others; and that certain bases, though present in spare quantities at the beginning of decomposition, gradually acquire a greater prominence as other basic substances disappear. A certain anology exists between the above-mentioned changes and those met with in the putrefaction of albumen. Nencki has shown that for the formation of indol a certain temperature is necessary; whilst the production of phenol, according to Baumann and Brieger, is independent of temperature. Odermatt has proved for indol what Brieger has for phenol—that it disappears completely to make place for other aromatic products. In the course of putrefaction, cholin, which is probably derived from lecithin, is perhaps the first alkaloidal substance to make its appearance. On the third day what Brieger has called "neuridin" ($C_5H_{14}N_2$) can be found. Neuridin forms with picric acid a picrate which crystallizes in feather-like masses of needles, which are almost insoluble in cold water and very difficult of solution in hot water. Neuridin is always found in company with cholin, but the latter gradually diminishes in quantity, whilst the former increases day by day. The fact that in slow putrefaction of human organs no strongly poisonous ptomaines can be shown to exist during the first few days deserves attention. About the time of the disappearance of cholin may be reckoned as the period when strong toxic products are developed. It is not known whether trimethylamin results from the decomposition of cholin or neuridin, but both these bodies contain its elements. Brieger refers to the appearance of a ptomaine on the seventh day which has hitherto been unknown. One of his observations showed that this new base was present even on the third day, though in very minute traces. With platinum salts the new base formed dark red masses which were composed of needles mixed up with spangles and spicules. The purified crystals were of a somewhat brighter color, and were found by Dr. Hirschwald to be about two millimetres in length, and to belong to the rhombic system of crystals. The crystals proved with polarized light to be doubly refracting. The base also forms a beautiful double salt with gold. This new diamin ($C_5H_{16}N_2$) is termed "cadaverin," and boils at a temperature of 115° to 120° C.; unpleasant is its odor, reminding one of coniine. A third diamin has also been differentiated, having the composition of a butylendiamin ($C_4H_{12}N_2$), but its reactions prove it to be a secondary diamin. The absurd name of "putrescin" is given to this substance, which may be detected on the fourth day of natural putrefaction, but is not present in large quantities until a week later. A fourth diamin called "saprin" has also been isolated from the products of decomposition of human organs. Neuridin, cadaverin, putrescin, and saprin are physiologically almost harmless; cholin in large quantities produces physiological effects like those of muscarin; whilst trimethylamin must also be given in large quantities in order to cause toxic effects. Brieger has, however, found two powerfully poisonous ptomaines in the cadaver. These poisons existed in large quantities on the fourteenth and twenty-first days of decomposition. One of these bodies is named "mydalein;" it exercises marked effects on the various functions of the body, increasing the nasal and lachrymal secretions, dilating the pupil, stopping the heart and breathing, and causing paralysis and death. After large doses the heart is found to stop in diastole. Severe diarrhœa and vomiting were observed in a cat as the result of the injection of a minute dose of the poison. Brieger has also investigated the nature of the products resulting from the action of bacilli in various media. He has separated highly poisonous bases from cultivations of the Koch-Eberth bacillus of typhoid fever. Intense salivation, diarrhœa, and paralysis were some of the toxic effects produced by these poisons.—*The Lancet*, August 15, 1885.

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STIMSON ON FRACTURES.

A Practical Treatise on Fractures. By Lewis A. Stimson, B.A., M.D., Professor of Pathological Anatomy at the University of the City of New York, Surgeon and Curator to Bellevue Hospital, Surgeon to the Presbyterian Hospital, New York, etc. In one very handsome octavo volume of 598 pages, with 360 beautiful illustrations. Cloth, $4.75; leather, $5.75.

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LEA BROTHERS & Co., Publishers, Philadelphia.

Bellevue Hospital Medical College.

CITY OF NEW YORK.

SESSIONS OF 1885–86.

The Regular Session begins on Wednesday, September 23, 1885, and ends about the middle of March, 1886. During this Session, in addition to the regular didactic lectures, two or three hours are daily allotted to clinical instruction. Attendance upon two regular courses of lectures is required for graduation.

The Spring Session consists of recitations, clinical lectures and exercises, and didactic lectures on special subjects. This Session begins about the middle of March, and continues until the middle of June. During this Session, daily recitations in all the departments are held by a corps of Examiners appointed by the Faculty.

The Carnegie Laboratory is open during the collegiate year, for instruction in microscopical examinations of urine, practical demonstrations in medical and surgical pathology, and lessons in normal histology and pathology, including the study of the various bacilli. The laboratories are under the direction of Professors Janeway and Dennis, assisted by Drs. Herman M. Biggs, L. J. McNamara, and J. S. Thacher.

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FEES FOR THE SPRING SESSION.

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For the Annual Circular and Catalogue, giving requirements for graduation and other information, address Prof. Austin Flint, Jr., Secretary, Bellevue Hospital Medical College.

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FORTY-FIFTH SESSION, 1885-86.

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THE PRELIMINARY SESSION will begin on Wednesday, September 16, 1885, and end September 30, 1885. It will be conducted on the same plan as the Regular Winter Session.

THE REGULAR WINTER SESSION will begin September 30, 1885, and end about the middle of March, 1886. The plan of Instruction consists of Didactic and Clinical Lectures, Recitations, and Laboratory work in all subjects in which it is practicable. To put the Laboratories on a proper footing a new building has been erected at an expense of forty thousand dollars.

UNIVERSITY BIOLOGICAL AND PATHOLOGICAL LABORATORY.—The Faculty, aided by generous friends, have enlarged the New Laboratory Building and established a Biological and Pathological Laboratory in connection with its Laboratory of Chemistry and Materia Medica. It is furnished with all the apparatus for the study of Bacteriology, and for special lines of investigation.

Two to five Didactic Lectures and two or more Clinical Lectures will be given each day by members of the Faculty. In addition to the ordinary clinics, *special clinical instruction*, WITHOUT ADDITIONAL EXPENSE, will be given to the candidates for graduation during the latter part of the Regular Session For this purpose the candidates will be divided into sections of twenty-five members each. All who desire to avail themselves of this valuable privilege must give in their names to the Dean during the first week in November. At these special Clinics students will have excellent opportunities to make and verify diagnoses, and watch the effects of treatment. They will be held in the Wards of the Hospitals and at the Public and College Dispensaries.

Each of the seven Professors of the regular Faculty will conduct a Recitation on his subject one evening each week. Students are thus enabled to make up for lost lectures, and prepare themselves properly for their final examinations without additional expense.

THE SPRING SESSION will begin about the middle of March and end the last week in May. The daily Clinics and Special Practical Courses will be the same as in the Winter Session, and there will be Lectures on Special Subjects by Members of the Faculty.

It is supplementary to the Regular Winter Session. Nine months of continued instruction are thus secured to all students of the University who desire a thorough course.

FEES.

For course of Lectures	$140 00
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THE FORTY-FOURTH REGULAR SESSION will begin on Monday, September 21, 1885, and continue until March 1, 1886.

There will be no preliminary Lectures. The course of studies extends over a period of three years and is a graded one, the voluntary three-term course formerly offered to the student having become obligatory. Preliminary examinations will be required from all students entering the College in all the branches of a good English education; where a Diploma or certificate of graduation from a literary or scientific college or high school is presented, this will exempt from the examination.

Practical work in the Anatomical Rooms and in the Chemical Laboratory is obligatory.

The Dispensary, in the new building on the College grounds, affords increased clinical facilities.

FEES.

Matriculation fee (paid but once)	$5 00
Fee for each regular term, including graduation and all other fees	90 00

For the Annual Circular, or any information, call upon or address the Dean, No. 3132 Washington Avenue.

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